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AN
EPHEMERIS
OF
MATERIA MEDICA, PHARMACY,
THERAPEUTICS
AND
COLLATERAL INFORMATION.

VOLUME V.—1898-1899.

BY
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BROOKLYN, N. Y.

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AN EPHEMERIS
OF
MATERIA MEDICA, PHARMACY, THERAPEUTICS AND
COLLATERAL INFORMATION.

VOL. V. JANUARY, 1898. No. 1.

Owing to the absence of the senior editor in Europe, no work of his will appear in this issue. The junior editor will simply continue to give his own annual contribution to these pages in the following :

BRIEF COMMENTS ON THE MATERIA MEDICA,
PHARMACY AND THERAPEUTICS OF THE
YEAR ENDING OCTOBER 1, 1897.

BY E. H. SQUIBB, M.D.

ALPHABETICALLY ARRANGED.

Read by title at the Fourteenth Annual Meeting of the New York State Medical Association on October 12, 1897.

A criticism made on these Comments from time to time since they began six years ago, has been recently repeated, and deserves just a moment's attention. It is that an unduly conservative view is frequently taken in regard to some of the articles mentioned—especially the newer ones. This the writer begs to take rather as a compliment to his efforts than as a defect to be corrected. The attempt is surely made always to be fair and impartial to all, but in reading over the vast amount of material often written, on the newer articles, especially, the writer must use his best judgment in

deciding how he would have his readers consider the articles in question. Where there is a chance to lean one way or the other, the conservative side is always the safer one, and the opinion so formed, though misguided, does less harm, as only delay occurs in recognizing the efficiency of the article if such may be the final verdict.

Acacia or true Gum Arabic continues to find more extended use each year, and to supply the increased demand at moderate prices substitutes are still looked for. The English Imperial Institute has recently reported on three substitutes obtained from India, one of which is apparently very satisfactory. It is a gum of *Odina Wodier*, known in India as *Jingan Gum*. The sample submitted was found to be wholly soluble in twice its weight of water, producing a thin, but adhesive, mucilage. A little more care in collecting the gum than was shown in the sample is all that apparently is needed to make it economically useful.

Acetanilid (Antifebrin) continues to be a very important agent in the hands of the practitioner, and the surgeon especially is rapidly making a more extended use of it. Its use in minor surgery chiefly as a dusting powder is becoming such a routine practice with an increased number of surgeons that it is no longer deemed necessary to make further formal reports of successful applications. Therefore only a few comments will be made here, and those in the way of the suggestions recommended, and the warnings necessary to be emphasized. Dr. W. A. Fallas, of Horton, Mich., writes to *The Medical News* (Vol. LX., page 183) as follows :

“In your issue of August 15, 1896, an article by Dr. J. J. Walsh, on ‘The Inhibitory Action of Acetanilid on Bacterial Growth,’ strongly attracted my attention ; and I was equally interested in Dr. Foote’s study of Formalin-gelatin, published November 14. His paragraph on acetanilid, in which he speaks of its comfortable and satisfactory action for two or three days, and of its ultimate failure to check or prevent suppuration, fully agrees with my experience. From this experience I was led to seek some addition to acetanilid which would fully inhibit suppuration. I first tried boric acid, acetanilid, and carbolic acid ; but the powders were not sufficiently absorptive, and the compound was too moist and pasty. After many trials I used this : Powdered acetanilid, 48 per cent. ; powdered boric acid, 15 per cent. ; powdered starch, finely sifted, 35 per cent. ; carbolic acid, liquid, 2 per cent. This compound, though slightly moist and adhesive, has all the effect of a dry dressing ; in fact, upon a wound it is or becomes perfectly dry.

Its absolute comfort leaves nothing to be desired ; under its use there is not, from first to last, the least discomfort except a momentary smarting on the first application, too trivial to be worth mentioning. The most exquisitely sensitive sore can in a few days be handled with impunity. There is no odor, even of the carbolic acid. It absolutely inhibits suppuration where it can reach the wound surface, and it checks and quickly abolishes suppuration if that be already present. The powder should be changed twice a day as long as there is a discharge to moisten it ; soon, however, the wound becomes absolutely dry, and the powder may be left for days undisturbed, and will still be found as dry as when applied, unless there is a pocket from which pus may come. Cicatrization is rapid and satisfactory.

“ Obviously, this powder would be unsuitable for introduction into a cavity, unless it was intended that the cavity should granulate from the bottom ; and, in that case, the possibility of easy removal of the masses formed by the pus soaking into the powder before the wound becomes dry, should be considered. On an accessible granulating surface, and upon a sutured wound, it is the nearest to a perfect dressing I have yet seen.”

Dr. E. S. Boland, of Boston, Mass., writes to *The Boston Med. and Surg. Journ.* (Vol. CXXXVII., page 95) a word of caution :

“ The present writer has just had to help care for a severe case of acetanilid poisoning in a young man of 19 years, in which the drug was absorbed from an immense burn of the second degree involving the entire back, at least two square feet being affected.

“ On the sixth day after the accident, the discharge being rather profuse and offensive, the drug (acetanilid) had been used to hasten cicatrization and to render the wound less offensive.

“ From disuse of the old endermic method of administering medicine, we are apt to forget how much a recently blistered surface can absorb.

“ Four hours after the application this patient was in collapse, and with livid lips, black finger-nails and general cyanosis, he looked startlingly like a recently-drowned corpse. At times the pulse could not be felt at the wrist, and he could not be aroused except by the most powerful stimuli, and even these failed at the climax of his depression. When aroused, his mind was clear and no pain was complained of.

“ The treatment was cardiac and general stimulants, hypodermically and by the mouth, the application of heat and inhalation of

oxygen gas. The acetanilid was wiped off with oil and vaseline from the burnt surface and zinc ointment and carron oil (one to four) applied. It was several hours before he could be pronounced out of danger."

Its use in "headache powders" is unfortunately greatly on the increase, and much harm is being done.

Out of the large number of cases of poisoning reported, only two will be mentioned here as being worthy of attention in emphasizing the danger in its use. Dr. Irving M. Snow, of Buffalo, N. Y. (*Archiv. of Pediatrics*, Vol. XIV., page 430), records a case in which the use of this agent on open and granulating surfaces of young infants is fraught with considerable danger from absorption. About 4 grammes (60 grains) were applied to the stump of the umbilical cord and after two days—the ninth day after birth—the infant became markedly cyanotic, the pulse quick and weak and the respiration 60. No signs of either imperfect expansion of the lung or congenital heart disease were present. Although restoratives were used no improvement in the condition was noticed for ten hours, nor until twenty-four hours had passed did any signs of recovery appear. The total duration of the cyanosis was seventy-two hours. A number of cases are cited by Dr. Snow in which unfavorable and, in some cases, disastrous results followed. He therefore naturally concludes that Acetanilid undiluted should be avoided in young children undergoing surgical operations. Especial emphasis is made on the danger in using it as a dressing for the umbilicus of the new born.

Drs. L. N. Gartman and M. V. Ball, of Philadelphia, Pa., report in *The Phila. Polyclinic* (Vol. VI., page 381) the following case of Acetanilid poisoning :

"C. R., aged 3 years and 5 months, was scalded, on the 17th of August, over buttocks, thighs, scrotum and penis. He was dressed with an ointment containing 10 per cent. acetanilid. About 3 ounces were used at the first dressing. Two days after the wound was re-dressed, some sloughened tissue was removed, leaving a raw surface, and 3 ounces of the ointment again applied. Two hours after this application, the child commenced to turn blue; this discoloration gradually deepened, until when the physician arrived, an hour later, the skin and mucous membranes were blackish blue; the nails of fingers, tongue and lips were ghastly. The smaller veins all over the body were prominent. The pulse was over 160 per minute. The temperature was subnormal, a profuse sweat

covered the body, and could be seen collecting on the forehead. The extremities were cold. Respirations were not affected.

“The child was drowsy, but whether this was due to some bromid and opium which had been administered during the morning, is not quite clear. Consciousness was retained, everything was taken by the patient that was offered to it. There were no palsies; the fingers were, however, slightly rigid. Sensibility was not impaired, the child crying when the injured surface was touched. Because of the injury to the penis, urine was voided with difficulty. A small quantity drawn with catheter showed specific gravity 1033, acid reaction, no albumin. The quantity passed in the next twenty-four hours did not exceed 10 ounces. The treatment consisted in restoratives, as whisky, ammonia, amyl nitrite, hot bottles and hot bath, strychnin. The color gradually changed to natural, but occasionally it would deepen to blue, until 7 P. M., six hours after, when it had entirely cleared up. Temperature increased to 101° the next morning and 103° the following evening, coming down to normal on third day. The urine gradually increased in quantity, and never showed albumin. The wounds healed nicely.”

Dr. Carl F. Bachmann, of Allegheny, Pa., in a letter to *The N. Y. Med. Journ.* (Vol. LXV., page 708) gives his views on the cause of the cyanosis from Acetanilid as being at variance with the text books :

“In some of our leading works on therapeutics I find it stated under the physiological action of acetanilide that the peculiar cyanosis of the face and fingers noticed on the administration of maximum doses of this drug is due to the conversion of hæmoglobin into metahæmoglobin and the breaking down of red blood-corpuscles. Neither of these statements is borne out by experiment unless very large doses are given, or the subject possesses a strong idiosyncrasy for the drug ; yet we find that the peculiar cyanosis (decided by blue tint of face and finger nails) often occurs when there are no other symptoms of poisoning, and the dose has not been excessive. This cyanosis I have found to be due to the *liberation of free aniline in the blood*, which disappears soon afterward, as soon as it is eliminated by the kidneys and skin. A similar cyanosis, though more pronounced, is found in the workmen of aniline-color works. This point may not be of vast therapeutic importance, yet may be of interest as an additional factor in the physiological action of acetanilide, which seems to have been overlooked or unknown, and I consequently wish to submit it on that account.”

Acid Acetic has been more extensively used in the past year in the way of applying it to the exhaustion of crude drugs, containing active principles. The drugs have been so completely exhausted as to put beyond all doubt the value of this Acid as a solvent. It is found that this Acid is so effective that a thoroughly representative Extract can be obtained which contains such a slight excess of Acetic Acid that it may be practically disregarded. Even this excess could be gotten rid of by heat if its presence was considered detrimental, but when the dose of the Extract in question is considered, the amount of Acid present is inappreciable. Moreover, such an Acetous Extract is found to be permanent, showing no signs of deterioration after a lapse of six or eight months. In the case of drugs containing oleoresins even, the exhaustion by this Acid has also proved to be quite complete, which proves that its solvent properties may be regarded as fully efficient for all classes of crude drugs—thus substituting it quite completely for alcohol as a solvent in the preparation of both Fluid and Solid Extracts. The ready miscibility of these Acetous Extracts with water without precipitation, together with the strength and uniformity that can be obtained by the use of this solvent, offsets the objection that may be raised against the small excess of Acetic Acid in the finished Extract, while the greatly decreased cost warrants the use of such Extracts even though there were most extreme disadvantages against them. Another very important advantage of these Acetous Extracts is that their active principles are evidently combined with the Acetic Acid to form salts which are no longer incompatible with many of the prominent medicaments now found in prescriptions. This latter is such an important advantage that it outweighs many minor disadvantages.

Acid Camphoric has again been brought out from its retirement by a prominent mention of its marked value in the excessive night-sweats of phthisis.

It may be well to recall here that this Acid is produced by the oxidation of Camphor by concentrated Nitric Acid. It occurs in fine colorless, needle-like crystals, often seen in the form of scales as well. It is odorless, has a slightly acid taste and readily soluble only in *hot* water. It was Dr. Ralph Stockman's article in the *Edinburgh Med. Journ.* (Vol. I., new series, page 45), which again brought this Acid and its application into prominent notice. He there goes into the subject at such length that it will be found of value to those who may be interested.

Dr. H. A. Hare, of Philadelphia, Pa., begs leave to remind Dr. Stockman and the profession that he had his first experience with it as long ago as 1890-91, and continues to advocate its use in the same class of cases (*The Therap. Gaz.*, Vol. XXI., page 164).

Acid Carbolie (Phenol) has lost none of its importance among its many rivals. Much has been written upon it in quite a varied sphere of usefulness. Naturally only the most prominent allusions can be looked for here. Mr. A. Ernest Maylard, Surgeon to the Victoria Infirmary, Glasgow, Scotland, contributes an article to the *British Medical Journal* (Vol. I. for 1897, page 1475) on "The Production of Asepsis in Acutely Septic Wounds by the free Application of Pure Carbolie Acid." He prefaces the clinical report of three cases in these words: "The following brief extracts of cases show the great potency of pure carbolie when freely applied, of rendering rapidly aseptic all the parts of an acutely septic wound. In some of these cases the septic process was that of acute traumatic gangrene, and some ounces of the pure acid were brushed over the raw and freely exposed surfaces. In each instance in which it was employed improvement set in immediately after the application," and concludes as follows: "I could add other cases to those briefly narrated above to show how powerful is the germicidal effect (for such I believe to be the action) of pure carbolie acid in all kinds of acute septic cases, whether these be of the nature of acute abscesses, of acute gangrene, or of septic inflammatory processes connected with malignant disease. There appears to be no pain connected with the application of the acid except so far as is entailed in the mechanical manipulation of the wound and its surfaces. When sloughs exist these should be practically soaked in the acid. On the living tissues the acid appears to have no deleterious effect; if allowed, however, to run over the skin it excoriates and causes pain."

Dr. Geirsvold, of Norway, has obtained excellent results in the treatment of Infecting Corneal Ulcers by cauterizing the ulcers by touching the surface with a Bowman's probe dipped in pure liquid Carbolie Acid. In some of his 12 cases, although complicated by suppuration of the lachrymal ducts, he did not find it necessary to use either the thermo-cautery, curetting or subconjunctival injections.

Dr. W. Kramer, of Glogau, Prussia, highly recommends (*Centralbl. für Chirurg.*, Vol. 26, page 1105) the injection of a solution of Carbolie Acid into the parenchymatous tissue of the tonsil in all cases of relapsing tonsillitis. He reports finding all the

ordinary methods of treatment of no avail in preventing frequent relapses. He "believes that frequent relapsing tonsillitis develops from latent foci of pus micro-organisms which have been left in the peritonsillar tissue from a previous attack, and stirred up into activity by some accidental cause. The good effect of the carbolic acid injection is, he believes, due to the fact that these foci are thereby rendered sterile."

Drs. Pilate and Vissemans, Surgeons to the Military Wards of the Hôtel-Dieu at Orleans, France, offer what appears to be a very simple and effective method of treating hydrocele in young patients by free washing with Carbolic Acid solution. After evacuation, they wash out the cavity of the tunica vaginalis with a weak solution of this Acid. They take pains to at first clean the surface by means of a brush and soap, and then wash with a solution of chloride of mercury. A trocar is next introduced, and when the serous fluid has been removed a warm 3 per cent. solution of this Acid is injected, but the precaution is taken of previously boiling this solution. This washing is repeated from 4 to 5 times, until the liquid is drawn off quite clear. The trocar is then withdrawn and the puncture closed. The patient evidently feels no pain, as this Acid acts as an anæsthetic. In 4 or 5 days effusion continues to occur in the sac, but this soon subsides, and the patient is enabled to go about ordinary work. A suspensory bandage is advised, however, for a time. Although this treatment has proved very satisfactory, it is only recommended in simple cases and in young subjects.

Dr. R. Botey, of France, makes use of the following mixture in the local treatment of tubercular laryngitis:

Carbolic Acid..	1 to 5 grammes	(15.4 to 77.2 grains)
Lactic Acid....	2 to 15 "	(30.9 grains to 4 drachms)
Neutral Glycerin	20 "	(about 5 drachms)

"The laryngeal mucous membrane is first anæsthetized with a 10 per cent. cocaine solution, after which the above mixture is applied to the affected parts. At first only a small amount of carbolic and lactic acid is used, the proportion being gradually increased up to the maximum indicated.

"This treatment combines the advantages of the two methods which at present are principally employed in laryngeal tuberculosis, viz., cauterization with lactic acid and painting with carbolic acid." (*The Medical Week*, Vol. V., page 408.)

Recognizing the fact that Carbolic Acid has been considerably

used in the past in the treatment of Enteric Fever, Surgeon-Captain R. C. Thacker, A. M. S., of the Station Hospital at Poonah, India, reports on some 23 cases in which he adopts a more guarded administration (*Brit. Med. Journ.*, Vol. I. for 1897, page 1344). He states: "I claim for carbolic acid, judiciously administered in enteric fever, that in the majority of cases it modifies favorably the duration and height of the pyrexia. The tongue rapidly shows a remarkable tendency to clean and become moist. The evacuations become odorless and inoffensive, and tympanitis is held in check. The mental clearness and physical vigor of the patient are well maintained, with frequently a rapid and complete recovery.

"I present a tabulated statement, giving the names, complications, relapses, and number of days in hospital of the 23 cases treated by the acid. Perhaps I might add that all the cases were most carefully diagnosed with the sanction and concurrence of the senior medical officer and the other medical officers serving here at the time, and in almost every instance they were of a severe and grave type."

Dr. Richard H. Quill, A. M. S., of Chatham, England, makes a reply to certain points raised in Surgeon Thacker's paper, which is of interest in connection with the subject (*Brit. Med. Journ.*, Vol. I. for 1897, page 1513).

The treatment of Tetanus by various methods is occupying a prominent position in the medical world and is of increasing interest. Mr. Arthur Eddowes, of Loughborough, Leicestershire, England, gives a detailed account of a case of "Traumatic Tetanus Treated by Hypodermic Injection of Carbolic Acid" with recovery, caused by a boot-nail puncturing the inner side of the ball of the great toe (*London Lancet*, Vol. I. for 1897, page 168).

Dr. Angelo Poli, of Italy, reports the case of a 16-year-old boy developing symptoms of tetanus 5 days after being kicked by a horse. His foot had previously been dressed with a piece of rag, a leaf and a coarse plaster. On admission to the hospital the wounded portion of the toe was excised and thoroughly cleansed with both Carbolic Acid and Iodoform. Potassium Bromide and Chloral were given internally, and a 1 percent. solution of Carbolic Acid was injected every 2 hours. On the second day the boy could open his mouth a little, and his face was less contracted than previously. On the fourth day trismus and opisthotonos were still prominent. On the sixth day the temperature was normal but the tetanic symptoms continued. At this stage the Carbolic Acid injections were given

every hour. On the twentieth day the boy was practically well, but the solution injections were continued every 2 hours for 12 days longer. Dr. Poli remarks that this case would apparently seem to support the equine theory of tetanus at first sight, but upon further examination he was convinced to the contrary and would decide that it really supported the telluric theory (*Gazz. degli Osped. e delle Clin.*, Vol. XVIII., first half year, page 32).

Prof. P. Muzio, an Italian practitioner, reports on a series of experiments in which he followed out the suggestions of others in the treatment of tetanus with this Acid, but his results were almost entirely negative.

Dr. S. Dunogier advises the following application for allaying pain from a decayed tooth :

Crystallized Carbolic Acid.	2 grammes (30.9 grains)
Oil of Lemon.....	2 “ (30.9 “)
90% Alcohol	10 “ (154.3 “)

The Oil of Lemon acts in disguising the odor of the Acid, and therefore in children a small piece of cotton soaked with this mixture may be readily introduced into the cavity, after having washed it out and dried it. Another small piece of the cotton is placed over the soaked piece either without anything on it or with a few drops of Tincture of Benzoin.

Apparently cases of poisoning by Carbolic Acid are on the increase both from carelessness and with the object of committing suicide. It is difficult to realize how the sense of smell can be so far blunted, and the marked burning taste of the Acid can be borne long enough to permit a sufficient quantity being swallowed to produce dangerous results. Another and possibly as frequent a class of cases of poisoning is produced while being treated by this agent. Dr. Edwin A. Heller, of Philadelphia, Pa., writes on this subject (*Phila. Polyclinic*, Vol. VI., page 316), giving the history of 3 cases.

“ A Case of Carbolic Poisoning from the Application of a Carbolic Compress to the Skin,” is related by Mr. R. Clement Lucas, of Guy's Hospital, London, England, in the London *Lancet*, Vol. II. for 1897, page 537.

Dr. Josef Levai, of Buda-Pesth, Hungary, attributes (*Pester medicin. chirurg. Presse*, Vol. 33, pages 178-227-251-275) many cases of gangrene directly to the prolonged topical application of this Acid even in weak solutions. He has observed as many as 26 cases from this very cause—12 after using a weak solution, and 14 from the use of the undiluted Acid.

Acid Citric is still receiving attention in the chemist's laboratory, and another claim of having accomplished its synthesis is announced. The reaction is of such a complex order in organic chemistry that it would be of little value to repeat it here.

California is so rapidly becoming a prominent center of supply, and producing such a fine quality of Lemon, that it is not at all surprising to read the recent statement that a factory for the manufacture of Citric Acid and Oil of Lemon is now established at San Diego. Forty thousand Lemons are worked up each week, but it is claimed that it has taken from 4 to 6 weeks to condense the juice of 60 to 70 Lemons into 1 pound of Acid.

In relation to its medicinal use we hear from Dr. Georg Müller, of Berlin, Prussia, that he has succeeded in healing up obstinate wounds by applying Lemon juice. He alludes (*Therap. Monatsh.*, Vol. XI., page 215) to one wound which had refused to respond to all methods of treatment for 4 months, in which he was greatly surprised to notice immediate signs of healing, and complete recovery from such an application. The juice and compresses were applied twice a day. Other cases have followed this one, showing equally favorable results.

"It is announced that Dr. Alexander Edington, Bacteriologist to the Cape of Good Hope Government, has found that the blood of animals affected by rinderpest, when treated with citric acid and kept for such a time as to insure the death of the contagium, will, when injected, immunize all animals exposed to infection. An animal thus treated received ten days later an injection of a large quantity of blood from another animal suffering severely from rinderpest, without being at all affected or suffering any rise in temperature. Dr. Edington has obtained equally satisfactory results from the bile of affected animals similarly treated and glycerinated. A herd of 128 cattle near Kimberley was selected for a field experiment, 126 being injected and 2 left for a control experiment. Of the 126 injected cattle, 1 shortly died (as was supposed from its infection beforehand from cattle on the adjoining farm, amongst which it was found that rinderpest was prevalent). The remaining 125 animals were ten days afterwards injected with virulent blood, which was at the same time and in the same dose injected into the 2 unprotected animals. Of the 125 injected animals, 2 had a slight attack of rinderpest, but recovered, and 123 remained quite healthy, but the 2 control animals died of rinderpest on the twelfth day. This method appears to give better results than the

French serum treatment or Dr. Koch's method. As proof of the demand that has arisen for the new injection, it is stated that 4 tons of glycerin have already been used by Dr. Edington in the preparation of his protective fluid, and that 14 tons are now on the way to South Africa." (*Brit. Med. Journ.*, Vol. II. for 1897, page 1015.)

Acid Lactic is rather a new agent to think of in relation to the treatment of tubercular laryngitis, but Dr. R. Botey, of France, recommends a formula containing Carbolic and Lactic Acids with Glycerin which will be found under the head of Acid Carbolic.

Dr. Zolotavine reports (*La Médecine Moderne*, Vol. 8, Sept. 18, 1897) having used this Acid with agreeable success in a long-standing case of arthritis deformans. Ten drops of this Acid were administered each day upon an empty stomach, no food being allowed for as much as an hour and a half after the dose. In this particular case the affection had existed 10 years and the patient was compelled to keep in bed for the year just previous. The dose was gradually increased up to 40 drops a day. The beneficial results of the Acid were evident about the end of 3 weeks. The pains in the joints were so modified that the patient was able to rise from bed and walk a little. The appetite improved and the abdominal pains entirely disappeared. Aside from this Acid no other internal medication was attempted. Light massage was employed externally. Gradual improvement continued until the time the report was made when the patient could readily walk without a cane and attend to regular duties.

Acid Picric (Tri-Nitro-Phenol) has taken considerable prominence among surgeons during the past year, especially in the treatment of burns, first recognized by Dr. Paul Thiéry, of Paris, France. It is now reported that its beneficial effects are becoming so well recognized by the laity that some factories in France keep a cask supplied with water saturated with Picric Acid standing in a convenient place for the workmen's use on short notice. The French Government have issued notice to make use of it in the army, and for surgeons on duty to report their observations.

Dr. Thiéry deplors the inconvenience of the staining of the flesh and clothes, but argues that this minor objection must be studied and overcome. To promote a more rapid action, and thus a more prompt relief, he now makes use of ether or alcohol as the solvent.

Dr. Rochon, of Paris, France, criticises the usual three forms of

dressing to the umbilical cord as all being defective. The oily dressing is imperfectly antiseptic and does not promote the keratogenic change of the new epidermic cells. He objects to the moist dressing not that it fails to furnish the requisite antiseptics of the part, but it delays the dropping off of the cord, and when this does take place often leaves an imperfect cicatrix. The dry dressing he finds defective on account of the danger to premature separation and resulting hemorrhage due to the rapid drying up of a rigid stump. Basing his recommendation on an experience of at least two years he therefore strongly recommends a 1 to 200 Picric Acid solution applied around the cord on a piece of absorbent cotton soaked in the solution. Decomposition is thus avoided and rapid cicatrization is promoted by reason of the remarkable cicatrizing property of this Acid. He has often found one dressing sufficient, but he usually finds it best to repeat it once either on the second or third day.

In relation to its use in the treatment of burns, only a few confirmatory statements will be alluded to here, as all the testimony appears to be in its favor. Dr. C. H. Souther, of Balaklava, South Australia, writes to the *British Medical Journal* (Vol. I. for 1897, page 60) as follows: "Mr. R. Shalders Miller refers to Mr. D'Arcy Power's notes on the use of a solution of picric acid for superficial burns and scalds. He suggests as a substitute hazeline, and describes its use.

"I had heard of and used picric acid in solution for burns even before I saw Mr. Power's contribution; it appeared to have been used with much success in certain iron foundries and sugar works, a large open vessel of it being kept in readiness for emergencies. I have used it (the solution to the strength of saturation) in several cases, one a burn of the third degree, and shall certainly not expect to find better results from any other application. I simply painted the whole burnt surface with a saturated solution of picric acid in water, using a large camel-hair brush with which to do so. In later cases I found that no evil results followed the practice of leaving the primary dressing (covered with oiled silk and cotton wool) on for a period of from three days to a week, and similarly with subsequent dressings. Greater simplicity, harmlessness and freedom from pain and resulting scar contraction can hardly be gained by hazeline, which latter, Mr. Miller admits, is expensive."

At a meeting of the Edinburgh Medico-Chirurgical Society, held on July 7th last, Mr. Miles read a paper recommending this Acid as

a primary dressing for either superficial or extensive and serious burns. His proceeding was to first cleanse all the parts with a weak Carbolic Acid solution; to prick all the blisters and then to apply lint soaked in a saturated solution of this Acid. Finally cotton wool is placed over the lint and a bandage applied. The subsequent treatment in regard to the dressings depends upon the amount of discharge, the temperature and other general symptoms. It was found of benefit to administer Chloroform while the dressing was being attempted, especially in children. It was found best to dress the parts about twice a week. Mr. Miles' cases have now reached 100 in the Leith Hospital, and the advantages he mentions are simplicity, painlessness, asepsis, small amount of discharge, infrequent dressings, the astringent action of this Acid in preventing inflammation, its effect in promoting the growth of epithelium, rapid separation of sloughs, absence of toxic symptoms and economy in dressing. The only disadvantages he found were staining of the hands and bed clothes. Vaseline smeared over the hands lessened this disadvantage, if it did not entirely obviate it. Washing them in alcohol afterwards tended in the same direction.

In the discussion which followed, Dr. Joseph Bell took occasion to state that he was not satisfied with his results, as they were not so satisfactory as those of Mr. Miles. Dr. W. Allan Jamieson also was disappointed, as he had not obtained satisfactory results in the treatment of eczema with this Acid.

Dr. Courtellemont, of Hôpital Saint-Antoine, Paris, reports (*Gaz. Hebdom. de Médecine et de Chirurg.*, Vol. 44, page 712, his favorable results in the treatment of burns, ulcers of the leg and simple wounds. He made use of a saturated solution of from 12 or 13 parts to 1,000 on well soaked compresses in all cases. Two prerequisites are: first, the absence of any impermeable outer covering, for the water must be allowed to evaporate from the solution and permit the Acid to become dry in order to insure its action; second, there must be a long interval between the applications in order to allow the dry Acid to act effectively. The dressing should not be disturbed for from 3 to 7 days. In similar treatment of simple wounds complete cicatrization was accomplished even more rapidly than in burns and ulcers.

Dr. Ion V. Sila-Novitsky, of Moscow, Russia, reports (*Le Bulletin Méd.*, Vol. XI., page 687) excellent results in 32 cases of burns — all children. He has no hesitation now in trying this treatment on a larger scale. In the case of slight burns, he makes no attempt

to disturb the dressing for 4 to 6 days, and then invariably expects to find the skin quite normal. In the severer cases, it is necessary to renew the dressings. In the majority of his cases the analgesic effect was prompt and complete.

Dr. William Maclellan, of Glasgow, Scotland, has written a paper (*Brit. Med. Journ.*, Vol. II. for 1896, page 1826) on "Pieric or Carbazotic Acid as a Therapeutic Agent, Especially in the Treatment of Certain Inflammatory Skin Affections," in which he states: "So far as I am aware, carbazotic acid has been little used, at least in this country, in the treatment of inflammatory skin diseases. In 1877 M. L. L. Grangé drew attention to the healing power of this remedy in some varieties of eezematous eruption. This therapeutic use of carbazotic acid seems to have been almost entirely overlooked, and is not mentioned in any of the larger works on dermatology that I have consulted. In a large number of cases in which I have employed pieric acid locally I have found it more successful, by far, than any of the other remedial agents more commonly in use, and I think it well worth a more extensive trial."

He divides his subject into two heads: I.—As a Local Application and II.—As an Internal Remedy, and finally concludes: "Thus carbazotic acid is a harmless topical agent. Although so nearly akin to carbolic acid, no apprehension need be entertained as to its absorption, even when applied to extensive surfaces. Like nitric acid, it limits its own action by coagulating the albumen of the tissues to which it is applied. As heat readily decomposes the acid, accidental stains may be removed from the underclothing by boiling. If the acid is employed internally, the patient should be warned of the discoloration which commonly follows, and it should be given to children in very small and tentative doses, as large doses are not well borne."

Dr. Henry Waldo, of Bristol, England, feels called upon to publish his experience as follows, although criticising somewhat Dr. Maclellan's conclusions: "As pieric or carbazotic acid is at present being much used as a local application in cases of eezema, and as Dr. Maclellan says that it is quite free from danger, may I say that in my experience, although it is most valuable in the majority of cases, still in one adult patient I prescribed it for it caused much prostration, and, in fact, all the symptoms of carboloria, with very dark urine. The dermatitis affected the arms and legs, and the drug was ordered to be painted on night and morning. After this had been done for ten days, the unpleasant symptoms I have

mentioned developed, and certainly resembled the action of carbolic acid, to which it is, as Dr. Maclellan mentions, constitutionally related." (*Brit. Med. Journ.*, Vol. I. for 1897, page 331.)

Dr. Maclellan replies: "In the *British Medical Journal* of February 6th, Dr. Henry Waldo writes a memorandum on a possible effect of picric acid when applied to an extensive "dermatitis." He (and also Dr. C. M. Allan, *British Medical Journal*, February 20th) endorses the opinion I have expressed, in my paper in the *Journal* of December 26, 1896, when I drew attention to the great value of picric acid in the treatment of certain inflammatory skin affections, but he expresses a fear that it may be absorbed and give rise to symptoms resembling those usually associated with carboloria. This appears to have happened in one case in which Dr. Waldo employed it. May I say, in reply, that I have used picric acid in a very large number of cases, and have applied it freely to large areas of inflamed and denuded skin, without ever once having seen any unpleasant symptoms follow its use? When picric acid is administered internally, even in considerable doses, the unpleasant symptoms to which it may give rise are not those suggestive of carbolic acid poisoning. Thus, while Dr. Waldo's experience in the one case to which he refers in his memorandum, is interesting, and should be borne in mind, it need not, I think, deter any one from making a free use of this valuable therapeutic agent in any case where its astringent and antiseptic properties suggest its use. As I have shown, the immediate coagulation of albumen which follows its application to a raw or discharging surface, limits its own action, and must in almost every instance practically render absorption impossible." (*Brit. Med. Journ.*, Vol. I. for 1897, page 640.)

At a meeting of the Paris Medical Society of the Hospitals, held on May 21st last, Dr. Gaucher reported the excellent results he had obtained in treating acute vesicular eczema with this Acid, encouraged by Dr. W. Maclellan's experience. He made use of a 1 per cent. solution every other day applied on cotton wool well soaked in the solution. This dressing was not disturbed for two days. The inflammation rapidly subsided, and the pruritus was relieved. Chronic eczema does not appear to respond to this treatment, but Dr. Gaucher suggests that it ought to succeed in pemphigus and other acute skin affections (*La Sem. Méd.*, Vol. 17, page 200).

At a meeting of the Paris Society of Dermatology and Syphilography, held on June 10th last, Dr. Leredde confirmed Dr. Gaucher's results, but Drs. E. Besnier and J. Darier had seen some

accidents and irritation from the use of this solution. Dr. Darier claims that its action in chronic eczema is not only useless, as given by Dr. Gaucher, but that it does much more harm than good.

Dr. A. Brousse, of Montpellier, France, lends his testimony to its marked applicability in acute eczema, and total failure in chronic cases. He uses Dr. Paul Thiéry's formula :

Picric Acid	3 parts.
Tepid Boiled Water	250 “

after allowing it to cool and then decanting.

“ Dr. Brousse attaches great importance to the following precaution : before applying the picric acid, he washes the parts well with a boracic lotion, so as to render the cutaneous surface as completely aseptic as possible. He rightly considers that the abscesses which occasionally supervene in cases of burns, treated by picric acid, are due to suppuration bacilli, imprisoned under the dressing, and states that he has met with small miliary abscesses which formed under the picric acid dressing in a case of eczema of the palm, as a result of deficient asepsis.”

Mr. C. M. Allan, Surgeon to the Longton Cottage Hospital, Stafford County, Eng., publishes (*Brit. Med. Journ.*, Vol. I. for 1897, page 457) “ A Note on a Few Surgical Uses of Picric Acid,” in which he says :

“ In recent wounds, with or without great loss of substance, this treatment is equally beneficial, and is not so troublesome nor so unsuccessful as skin grafting, where the size of the wound would render that advisable. I have under my care a wound of the forearm with loss of skin which a hand could not cover, healing rapidly under this combined treatment after the Thiersch method had failed. In that most dangerous and most intractable form of hæmorrhage from wounds in hæmophilic subjects picric acid solution acts better than any form of treatment I have tried. Within the last few years I have had two such cases, one of which belonged to a distinctly hæmophilic family. The first, a cut several inches long, was sprayed with the acid while the blood was being mopped off with wool ; and treated thus several times daily, did better than with iron and other astringents. The second, an abscess of the glands of the neck after scarlet fever, which necessitated incision, was packed with picricized gauze and did well.

“ In cases of severe cellulitis arising from the introduction of some irritant poison, and when incision or amputation is necessary,

the bleeding from the paralyzed and dilated radicles becomes almost uncontrollable. If the incision is packed with gauze wrung out of the picric solution the bleeding is soon controlled. For the oozing after the amputation the spray is much more successful than hot water, yet a combination of both may be used with great advantage, the water being used first (as it would decompose the acid if both were combined) and the spray applied immediately after. The acid acts as an astringent and antiseptic hæmostatic, and the parts heal *cito, tuto, et jucunde*."

Actol (Silver Lactate), the surgical antiseptic alluded to here last year, has been little heard of in the current medical literature of the past year, except that it appears to have now some value as an antiseptic. Dr. Marx has carefully experimented with this agent to determine the extent of its claimed disinfecting property, for Dr. B. Credé, of Dresden, Germany, claims that it disinfects the whole body. Dr. Marx met with disappointing results in this line and reports that he finds it has no such extensive action. He did verify its antiseptic property, however, and recommends further trials.

Äirol (Bismuth Oxy-Iodo-Gallate) has been more generally recognized even than last year as a most efficient antiseptic. Dr. C. Hägler, of Basle, Switzerland, has pushed his investigations still further and reports many other applications where it is of marked service—particularly striking results in such superficial lesions as ulcers and burns.

Prof. P. Bruns, of Tübingen, Wurtemberg, Germany, makes use of the following paste in wound dressing :

Äirol.....	1 part
Acacia Mucilage.....	1 “
Glycerin	1 “
Kaolin	2 parts

which he spreads with a spatula rather thickly over the sutured wound, and rubs it into the suture holes with the finger. It appears to be a non-irritant and dries rapidly, but allows the secretions to permeate it (*Beiträge zur klin. Chirurg.*, Vol. XVIII., page 507).

Dr. Hugo Tausig extols it as a most efficient substitute for Iodoform in paronychia, boils, carbuncles, chronic ulcers of the foot, otitis media, soft chancre, acute and chronic gonorrhea (using a 10 per cent. emulsion of Glycerin injection) and trachomatous conjunctivitis—of all of which he has treated one or more cases.

Dr. L. de Sanctis, of Rome, Italy, reports most "brilliant" results in the treatment of both secreting and pruriginous intertrigo, when Äirol is dusted on in the powder form. All the distressing symptoms were immediately relieved (*Gazz. degli Ospedali*, Vol. 17, page 1389).

Dr. H. Stauffer, of Travers, Switzerland, fully corroborates Dr. Hägler's experience in the treatment of burns, and adds varicose ulcers of the leg and bedsores to his list of affections. He has found its marked analgesic action is increased by making use of the following formula :

Äirol	1 part
Lanolin	10 parts
Distilled Water.....	10 "

Dr. J. Löblowitz, of Prague, Prussia, reports the results of his experiments with this agent, and finds it of great value in primary syphilomata, soft and hard chancres and wounds resulting from the incisions of suppurating buboes, where it was found to act particularly well.

Dr. W. Howald, of Bern, Switzerland, reports good results in the treatment of gonorrhea with the following formula :

Äirol	2 parts
Distilled Water	5 "
Glycerin	15 "

which will check the discharge most efficiently (*Corresp.-Blatt für Schweizer Aerzte*, Vol. XXVI., page 753).

Drs. F. Aemmer, of Basle, Switzerland, M. O. Goldfarb and G. A. Zelenski, of Kherson, Russia, call attention to some disadvantages in using this agent, such as bismuth poisoning, intense pain, and the formation of large bullæ when introduced into abscesses, or in the form of suppository introduced into an anal fistula (*La Sem. Médicale*, Vol. 17, Annexes, page CLVIII).

Dr. Charles Cassan reports most favorable results in the treatment of metritis by the introduction of intra-uterine plugs saturated with Äirol. He reports 13 cases, 9 of which were completely cured ; 3 were simply improved, the patients having refused to go on with the treatment. In one case the treatment failed entirely; the woman was very unmanageable and was also suffering from salpingitis in addition to her metritis. Even in the unfavorable case, although the salpingitis remained unaffected, the metritis was improved and the leucorrhœa almost entirely ceased.

Dr. G. Valenti, of Italy, recently reported very favorable results in various forms of keratitis and purulent conjunctivitis in a paper read before the Royal Academy of Medicine in Rome, Italy. His cases included kerato-hypopyon, trachomatous conjunctivitis, phlyctenular and simple ulcerative conjunctivitis—using the powder form and ointment. In the discussion which followed, however, no one else appeared to have had such good results as he reports (*La Riforma Med.*, Vol. IV. for 1896, page 737).

Good results are reported by Dr. P. Ardin-Delteil, of the Montpellier Hospitals, in the use of the following formula :

Aïrol.....	1 gramme.
Vaseline.....	20 grammes.

in ophthalmia neonatorum. Applications were made twice a day and removed after about ten minutes' contact. Improvement began before 24 hours had passed and rapid recovery resulted (*La Presse Médicale*, Vol. V, Annexes, page lxxxix).

Drs. E. Venuti and P. Barbagallo, of Catania, Sicily, have reported on 11 cases of diarrhea in adults treated by this agent in doses varying from 100 to 300 milligrammes (about $1\frac{1}{2}$ to $4\frac{1}{2}$ grains), amounting in all to 200 to 900 milligrammes (about 3 to 14 grains) during a day. The cases were acute and chronic intestinal catarrh, and tubercular diarrhea. The number of stools rapidly decreased and the pain passed off.

Dr. Domenico Fornara, of Taggia, Italy—a town just outside of San Remo—had the opportunity of trying this agent in a typical case—a woman 29 years of age—of leprosy, with very encouraging results. With the object of confirming his diagnosis, Prof. Profeta, of the University of Genoa, examined the case for him and found that the eyeball and periosteum of the clavicle had then been attacked, and that it was a typical case of five years' standing. Aïrol was dusted on the ulcers and open abscesses, a 10 per cent. vaseline ointment applied to the conjunctivæ and rubbed over the whole body, and again a 10 per cent. glycerin solution injected where softening of the tissues had begun. The case rapidly improved—in about two months' time—and no permanent ill-effects followed. The gums did become discolored by the bismuth, and when the doses were much increased in size, a certain amount of prostration occurred, but the natural remedy for these conditions was promptly applied. The formula for the injection used was :

Aïrol.....	1 part
Glycerin	7 parts
Distilled Water.....	2 ..

Tonics and massage were energetically administered to assist in the very remarkable amelioration of this evidently severe case. Dr. Fornara is so confident of his specific results that he undoubtedly is very desirous of having Aïrol tried further and extensively (*Wien. medicin. Blätter*, Vol. XX., page 135).

Alumnol, the astringent and antiseptic, has been little commented upon in the medical literature of the year, although there are other evidences to show that it is still in use. Those who have taken pains to mention its use have simply verified what has been previously claimed for it. The following formula is recommended for an efficient bougie :

Alumnol.....	0.25 grammes (3.8 grains)
Rice Starch.....	2.00 “ (30.9 “)
Sugar.....	3.00 “ (46.3 “)
Glycerin Ointment.....	0.50 “ (7.7 “)
Acacia Mucilage	3 drops.
Distilled Water.....	8 “

To be made up into 10 bougies.

Ammonol (so-called Ammoniated Phenyl-Acetamide), “ the antipyretic, analgesic and stimulant,” continues to be pushed by the now well-known manufacturers, and apparently the favorable testimony of more physicians than a year ago have been obtained, if the published reports are to be believed, and there is little doubt that the physicians’ signatures are trustworthy. Samples continue to be liberally distributed, and possibly many are tempted to lend their aid to the manufacturers by results which they claim to be successful with this new product. One of the most prominent mentions of this article was reported by Dr. C. A. Herter, of New York City, at a meeting of the New York Neurological Society, on November 5th last, when the subject of the Pathology and Treatment of Migraine was before the Society. Dr. Herter reported that he obtained the most relief from pain from the use of Ammonol. During the discussion which followed, out of the seven practitioners speaking, only two mentioned having used Ammonol: Dr. Joseph Collins, who stated that he had found Ammonol of no use whatever, and Dr. C. H. Brown, that 800 milligrammes (about 12½

grains) had caused extreme and dangerous prostration. He also had not observed any benefit from its use in other cases.

A careful examination of this agent has recently been made by Mr. George M. Beringer, of Camden, N. J., and his results are so convincing that it is thought advisable to quote his full report here as it appears in the *American Journal of Pharmacy* (Vol. 69, page 150):

“The manufacturers state that ‘Ammonol is a product of the Amido-benzene series ($C_6H_5NH_2$). It differs essentially from the other medicinal coal-tar products, especially in that it contains ammonia in an active form and has a stimulating action on all the vital functions.’ Its medicinal action is claimed ‘to be stimulant, antipyretic and analgesic.’ The chemical composition is given as ‘Ammoniated-Phenylacetamide,’ but the chemical formula given on the label, ‘ $C_6H_5NH_2$,’ is the accepted formula for *amido-benzene*, which is commonly spoken of as *aniline*.

“The writer was induced to make an examination of this *valuable new coal-tar derivative* (?). It is a powder, having a very faint yellow color, put up in 1 ounce vials. The odor is strongly ammoniacal, and on smelling the vial one can readily detect the peculiar empyrenumatic odor of commercial ammonium carbonate. On closer examination, even with the naked eye, one can detect small particles of a crystalline character, indicating imperfect comminution of a crystalline ingredient. This is the so-called *amorphous micro crystals* of the manufacturer’s description.

“One gramme of the powder was rubbed up with 20 Cc. of water and poured on a tared filter, and the mortar and filter carefully washed with an additional 10 Cc. of water added in small portions. After drying, the residue was a white powder, weighing .360 Gm. A portion left no ash on incinerating. On boiling with concentrated potassa solution it was converted into aniline, and, with chloroform, readily yielded the isonitrile reaction. From these tests, also supported by solubility and color reactions, I was led to conclude that this was pure phenylacetamide, or acetanilid. According to the U. S. Pharmacopœia, acetanilid is soluble in 194 parts of water, and so the 30 Cc. of water used would have extracted .154 Gm., and this, added to the undissolved portion on the filter, would give the total amount of acetanilid as .514 Gm., or about 50 per cent.

“The filtrate was a light canary-yellow-colored solution, and, on testing, showed the presence of sodium and ammonia as carbonates.

“ The filtered solution of 1 Gm. of ammonol in 30 Cc. of water, evaporated on the water-bath, yielded a residue of .222 Gm., and on prolonged heating minute micaceous crystals separated and sublimed into loose tufts on the surface. These crystals proved to be acetanilid, showing that, as stated above, it had been partly extracted by the water, and that it was more or less volatile at the temperature of the water-bath. On incineration, the residue left .158 Gm. ash, which required 29 Cc. $\frac{N}{10}$ sulphuric acid for neutralization, which, calculated for sodium bicarbonate, would be .24317 Gm.

“ One Gm. of ammonol was incinerated, and left an ash weighing .157 Gm., which, titrated with $\frac{N}{10}$ sulphuric acid, required 30 Cc. or, calculated as sodium bicarbonate, .2515 Gm. This would indicate the presence of about 25 per cent. of sodium bicarbonate in the product, and leave 25 per cent. for ammonium carbonate.

“ On adding hydrochloric acid in excess to the canary-colored aqueous solution, the color is changed to a rosy pink, which is again changed to the pale yellow on adding ammonia water. With nitric acid, the color is also changed to pink, but in excess is destroyed, the solution becoming colorless, and ammonia does not again restore the original color. From these reactions I became convinced that a small amount of some aniline color had been added as a disguise, and not for medicinal action. An examination of a number of so-called aniline orange and yellow colors, for one possessing similar reactions and tinctorial properties, was made, and the dye known as *metanil-yellow* was found to give similar reactions. According to Allen (Commercial Organic Analysis, Vol. III., Pt. 1, p. 184), metanil-yellow or orange MN, is the sodium salt of diphenylamine-azobenzene-meta-sulphonic acid.

“ From my examination, I am compelled to conclude that ‘ammonol,’ instead of being a new ‘coal-tar derivative,’ is merely an admixture of the well-known acetanilid, sodium bicarbonate and ammonium carbonate, and that the following formula represents its real composition :

R Acetanilid.....	10 grammes.
Sodium bicarbonate	5 “
Ammonium bicarbonate.....	5 “
Metanil-yellow.....	0.005 “

“ Mixtures of acetanilid and sodium bicarbonate, as an antacid and antipyretic and analgesic, have been in daily use by nearly every

physician for at least a decade. The addition of ammonium carbonate as an arterial stimulant is not unusual, and in many cases such a mixture must undoubtedly prove serviceable. Mr. Joseph W. England informs me that at the Philadelphia Hospital they use an ammoniated acetanilid, the formula of which is :

Ammonium carbonate.....	1 grain.
Sodium bicarbonate	1½ grains.
Pulv. acetanilid.....	2½ “

Misce.

Dose, one to three powders.

“Ammonol thus appears to be another of the numerous mixtures of acetanilid that are being palmed off on the gullible physicians as new and valuable discoveries. The names published in their circulars would indicate that the Ammonol Chemical Company have been unusually successful in playing on the credulity of quite a number of prominent practitioners, and medical as well as pharmaceutical journals.”

Amygdophenin—an analogue of Phenacetin—the new compound derived from Par-Amido-Phenol alluded to here last year, has not been heard of in the current medical literature of the past year.

Amyloform, the proposed substitute for Iodoform, is formed by the combination of Formaldehyde with Starch. It has recently been patented and introduced by Prof. A. Classen, of Aix-le-Chapelle, France. It appears as an almost impalpable white powder, without odor and taste, and non-toxic. It is practically insoluble in all the ordinary solvents and does not decompose even at a high temperature. It, however, splits up into its component parts when in contact with suppurating wounds. It is reported to have succeeded in a number of cases of deep wounds with suppuration of bone from osteomyelitis or tubercle where Iodoform had been used with much satisfaction. In varicose ulcers of the leg and in the primary sores of syphilis good results have been obtained.

It is claimed to be an excellent antiseptic and deodorizer without any irritating properties, and is cheap. It looks to be a formidable rival of Glutol. More definite data will no doubt follow before long.

The addition of Iodine to the above compound gives enterprising manufacturers a chance to offer a new compound called “Amylo-Iodoform”—also a substitute for Iodoform.

Anäsin is a new synthetic, hypnotic and anæsthetic introduced by its manufacturers in Basle, Switzerland. It is claimed to be an aqueous solution of Tri-Chlor-Pseudo-Butyl-Alcohol or Aceto-Chloroform. Its physiological action was investigated by Prof. Kossa and still later by Dr. Zoltán von Vámosy, of Buda-Pesth, Prussia (*Deut. Med. Woch.*, Vol. XXIII., Therap. Beilage, page 58). It is said to resemble Chloral Hydrate in its hypnotic action, the dose being 500 milligrammes to 1 gramme (7.7 to 15.4 grains). Even the maximum dose may be administered without producing ill-effects. A 1 per cent. solution is found to have the same anæsthetic properties as a 2 to 2½ per cent. solution of Cocaine Hydrochlorate. Its advantages are freedom from toxicity, does not irritate when applied locally, keeps well and may be sterilized. It has been used in the eye, injected subcutaneously, applied to the larynx, pharynx and nasal mucous membrane, and in dental operations. When applied to the tongue or eye, for instance, the anæsthesia is slow in developing, as its diffusibility is low, thus going to show that it must in all cases be applied directly to the spot requiring its anæsthetic action. It has an advantage over Cocaine as used in the eye in that it does not produce mydriasis. The iris is not affected by it. Further researches are urged.

Analgen (Ortho-Oxy-Ethyl-Ana-Mono-Benzoyl-Amido-Quinoline) has again been brought into notice by the report of 59 cases in the practice of Dr. Moncorvo, of Rio de Janeiro, Brazil, exclusively used in the treatment of children. 33 of the cases were various forms of malaria. The remaining 26 comprised quite a variety of affections: tuberculosis, lymphangitis, arthrosynovitis, parotiditis, Potts' disease, hip-disease, epilepsy, hysteria, chorea, otalgia, herpes zoster, urticaria and painful tumor of the liver. The youngest child was 20 days old, the oldest 13 years. The dose varied from 250 milligrammes to 3 grammes (about 3.8 to 46.3 grains) during the 24 hours. The urine becomes a deep yellow or red color whenever large doses are administered, but albumin or sugar was never found. No unfavorable action in the respiration or circulation was ever noticed. The malarial cases responded promptly and the duration of the attack was much shortened. In the 26 cases of the various affections, the pain was relieved as well as the high temperature reduced. It was administered in slightly acidulated water, but as it has no taste it is well suited for children (*Bull. de l'Académie de Méd. de Paris*, Vol. XXXVI., page 574). It is recommended to give Sodium Bicarb. with it to avoid discoloration of the

urine, for it is argued that the discoloration is due to its decomposition in the system by combining with the uric acid. The Sodium Bicarb. prevents this.

Anilipyrin is the name given by Drs. A. Gilbert and Yvon to a mixture of Acetanilid and Antipyrin, and offered as a new antipyretic and analgesic. If equal parts of Acetanilid and Antipyrin are mixed and brought to the liquifying heat—105° C. (221° F.)—a product is formed which the introducers call Anilipyrin A; if 2 parts of Acetanilid and 1 part of Antipyrin are treated in the same way Anilipyrin B is formed. Both these products are readily soluble in the usual solvents, even more so than the component parts separately, for 43 grammes (about 1 oz. 3 drachms) will dissolve 10 grammes (154.3 grains) of distilled water at 15.6° C. (60° F.), whereas only 16 grammes (246.9 grains) of Antipyrin and 50 milligrammes (4.5 grain) of Acetanilid will dissolve in the same quantity of water. As would naturally be inferred, this condensation product is indicated in influenza, acute articular rheumatism, migraine, neuralgia and the like. From experiments upon guinea-pigs, it proves to be more marked in its effects than Antipyrin and less marked than Acetanilid. It is toxic to a slight degree. The dose recommended is 500 milligrammes (7.7 grains) up to a daily dose of 1 to 2 grammes (15.4 to 30.9 grains).

Clinical reports are awaited.

Anozol is the name coined by Dr. Poliecarpo Diaz, of Salamanca City, Mexico, for a mixture of powdered Thymol and crystals of Iodoform, to furnish Iodoform “free from objectionable odor,” as the composition of the name indicates. The proportions are 100 to 200 milligrammes (1½ to 3 grains) of Thymol to 1 gramme (15.4 grains) of Iodoform. The odor of the mixture is that of Thymol. A general verification of this desired but doubtful result is awaited.

This name should not be confused with Anusol—a very different product—to be alluded to here later.

Antinonnin (Potassium Ortho-Di-Nitro-Cresolate), recommended as a disinfectant and parasiticide this time last year, has been unheard of, and no doubt has retired for good.

Antinosin (Sodium salt of Tetra-Iodo-Phenol-Phthalein) is evidently better recognized now than a year ago. Little has appeared about it in the foreign medical literature, but it has been more frequently reported upon in this country.

Dr. Rudolf Müller has made a report (*Aerztliche Rundschau*, of Munich, Vol. VII., page 1) of his experience with it in gynecological and obstetrical practice. For disinfecting in minor gynecological operations, as an ablution for the external genitals of a parturient woman, and in the form of a vaginal douche, Dr. Müller finds a 2 to 2½ per cent. solution of considerable value. In his obstetrical practice he makes use of a 2 per cent. solution where he formerly used a 1 to 5000 Corrosive Sublimate solution.

Dr. G. De Buck, of Belgium, reports that as a surgical antiseptic, a 1 to 200 solution of this agent meets all the necessary requirements.

In this country, the principal definite reports are as follows: Dr. Claude A. Dundore, of Philadelphia, Pa., writes on "The Use of Nosophen and Antinosin in Surgery," and concludes: "A trial of these two iodine combinations by any one not acquainted with their advantages will, I am sure, in a very short time convince them of their superiority over like agents heretofore employed, especially in regard to freedom from toxic effects."

Dr. Archibald L. Dix, of Philadelphia, Pa., reports a case of "Lupus," successfully treated by Antinosin, in which he makes the strong statement: "After a few weeks of the use of this remedy, and trimming the edges from time to time, the callous indolent sore of over three years' standing became gradually transformed into one of a clean nature. The granulations were of a bright healthy type. The powder was then changed for one of a milder action, composed of bismuth subnitrate, twenty parts, antinosine, one part. This combination was maintained in use until healing was complete, which was gradual and uninterrupted."

At the Annual Meeting of the N. J. State Medical Society, held in Atlantic City, N. J., on June 22d last, Dr. Talbot R. Chambers, of Jersey City, read a report on "Progress in Ophthalmology and Otology," in which he states that Antinosin solutions and Nosophen are excellent substitutes for Iodoform. When discharge is present, he emphasizes the importance of keeping the parts clean. To accomplish this most satisfactorily, he has found the best means is syringing with Carbolic Acid solution first, wiping out with cotton-tipped probes saturated with Hydrogen Dioxide Solution and drying, then follow this with a 5 per cent. solution of Antinosin on the cotton-tipped probes (*Journ. Amer. Med. Assoc.*, Vol. XXIX., page 179).

Antiphthisin has had to take a comparatively menial position

on account of the very prominent position assumed by Prof. Koeh's New Tuberculin, so that little has been seen upon it throughout the past year.

Antipyrin (Phenazone) has lost little of its importance to the medical practitioner during the past year, although cases of its ill-effects continue to be reported. Dr. G. Lyon reported to the Therapeutical Society of Paris, France, at its meeting on March 10th last, that he had met with such cutaneous eruptions as scarlatinoid or rubeolar erythema. Dr. Jasiowiez also reported like cases, but stated that he had observed that disagreeable effects are far less likely to occur if the Antipyrin be given in some liquid form of prescription rather than in the customary powders. Prof. Ponchet called attention to marked disturbances of the circulation at times which even went as far as collapse after administering this agent. Dr. Bardet reported a case under the charge of Dr. Goldschmidt, of Strasburg, Germany, in which even a small dose would produce general discomfort, dizziness, nausea, and erythema, which was quite general, with a very marked pruritus, which finally resulted in desquamation. No albumin was found at any time in the urine.

Dr. Dalehé now makes a second report to the Paris Therapeutical Society, in which he speaks of having observed another case of ulcerating membranous stomatitis due to the administration of this agent. "The patient was a man, sixty-five years of age, arthritic and affected with hæmorrhoids and gall-stones, who had never presented any symptoms of intolerance in respect of antipyrin, which he was in the habit of taking frequently. One day, however, after the ingestion of a cachet containing 1 gramme (15.4 grains) of this substance, he developed acute aphthous stomatitis. Subsequently, the ingestion of 1 gramme (15.4 grains), and later of 50 centigrammes (7.7 grains) of Antipyrin produced similar, but much more intense, symptoms. At this time, the patient suffered from ulcerating membranous stomatitis, with ulcers on the tongue, lips and cheeks. The last attack was also associated with a purpuric eruption on the skin, followed by slight ulceration of the scrotum.

"It is worthy of note that these ill-effects did not arise until the general health of the patient began to be impaired. Examination of the urine one day revealed the presence of a small quantity of sugar, but this glycosuria soon disappeared.

"During the last attack of ulcerating membranous stomatitis the urine contained only phosphates and urates in excess, but some time later there were 3.26 grammes (50 grains) of sugar per litre (about

1 quart). There was never any albumin. Renal inadequacy, therefore, does not account for all cases of intoxication by antipyrin." (*The Medical Week*, Vol. V., page 10.)

Dr. A. Vidal, of France, reported early this year a case of exceptional intolerance to this agent on three separate occasions of its administration to relieve violent headaches (*Gaz. hebdom. des Sciences Méd. de Bordeaux* for 1897, page 51).

Dr. J. Spanoudis, of Port Said, Egypt, discourages its use even in the ordinary antipyretic daily doses of 2.5 to 3 grammes (about 39 to 46 grains) in erysipelas and other infectious diseases where the kidneys are generally affected to some extent, and where it is all the more important not to increase the obstructive action already existing, even though Dr. J. Foustanos, of the State Hospital of Syra, Greece, firmly believes and reports that it is a specific in erysipelas, as far as he has yet observed.

Cases of poisoning continue to be reported, but they chiefly occur when used by the laity in nostrum and so-called headache remedies. Toxic symptoms have occurred when using this agent in conjunction with Calomel, but such ill-effects undoubtedly were due chiefly to the incompatibility of the two agents.

In conjunction with Arsenous Acid given in progressively increasing doses, very gratifying results have been obtained by Dr. A. Marfan, of France, in the treatment of chorea. He claims that this combination gives better results than other agents, but involves the necessity of following his very definite directions (*La Presse Médicale*, Vol. V., May 29, 1897).

Dr. Guibert, of France, reports that this agent is one of the most harmless for the suppression of the lacteal secretion. He has been using it for six years, and now makes his report on 19 cases. As it has been shown that Antipyrin is readily eliminated by the kidneys, attention must be paid to the normal action of this organ in order to produce the desired results.

On December 20th last Dr. C. Modinos, of Alexandria, Egypt, reported his successful treatment of both acute and chronic nephritis with 0.75 to 1.5 grammes (about 12 to 24 grains) of this agent daily. Marked improvement in the general condition of the patients was noticed, and not only a rapid decrease but often a complete disappearance of the albumin took place. He explains its action as being anti-toxic to the peculiar toxic principles of this affection.

Dr. Le Goff, of France, claims beneficial results with this agent

in pertussis, given with Syrup of Gooseberries as a flavor and an excess of Vichy Water (*Le Progrès Médical*, Vol. II. for 1897, page 72).

Dr. Rendu, of Paris, France, has found this agent combined with Tannin efficient in recurrent epistaxis caused by vascular tumors of the skin or mucous membrane. He uses the following formula :

Antipyrin	0.5 grammes (about 7½ grains)
Tannin	1.0 " (" 15 ")
Powd. Sugar	10.0 " (" 154 ")

He recommends the administration of the above several times a day, which he finds will control the bleeding from the very first day, and completely stop it by the third (*Gazette des hôpitaux*, Vol. 69, page 1322).

Dr. Santesson, of Stockholm, Sweden, calls attention to his successful use of this agent to assist in the administration of quinine hypodermically when used after severe attacks of malaria. He calls attention to the great need that has always existed for this mode of administration, and alludes to the fact that it had been used in 1894 successfully and quite extensively in a severe epidemic of malaria in Algiers. The formula used was that of Laveran, as follows :

Quinine Hydrochlorate	3 parts.
Antipyrin	2 " "
Distilled Water	6 " "

This solution permits an injection without pain. Dr. Santesson believes a new salt is formed by this combination, and is so confident of this that he has adopted the new name of Chinopyrin.

Antitoxin has lost none of its previous interest and importance with the medical profession. In point of fact more practitioners are inclined to at least listen to its beneficial results as reported. Final conclusions, however, are not yet in order, although an immense amount of testimony is accumulating, leaning towards its specific action. What has influenced these favorable reports more than all other causes is the approach to more uniformity in the product of the different rival manufacturers and the more or less successful attempts to test and standardize all the products before offering them to the medical profession. Improvements in the manufacture of Antitoxin are also being made from time to time. One

of the latest reports comes from Dr. Smirnow through the Imperial Institute of Experimental Medicine at St. Petersburg, Russia. Hitherto its preparation has necessitated great expense and many months' time, whereas this new method saves in both expense and time. It consists in simply submitting a virulent diphtheria broth culture to electrolytic action which gives a resulting product of great power and efficiency. A dog weighing from 18 to 20 pounds subcutaneously inoculated with 0.5 Cc. (about 8 minims) of a virulent broth of this kind generally dies in from 2 to 2½ days. If treatment with the new serum is begun even one day after inoculation only from 3 to 5 Cc. (about 49 to 81 minims) of this new serum will be sufficient to save the animal's life. Little has been heard of this improved method, however, since its announcement, and it may be that it has not succeeded in a practical way.

The most marked improvement announced as claimed by Prof. Behring is in now offering an extra potent serum in the dry form, put up in hermetically sealed bottles. It contains no preservative whatever as the sealing accomplishes its preservation for any length of time. It is very soluble in water and this solution must be accomplished before administering. This preparation is claimed to be especially valuable for immunizing purposes, as the immunity obtained will last about four weeks. Prof. Behring now hopes that the few remaining skeptical practitioners will be won over by this evidence of reliability and safety of the improved serum.

There is marked evidence of a commercial rivalry among the manufacturers of this agent, especially in France and Germany, which, it is to be hoped, will not be the cause of an inferior article being introduced. Such a rivalry, if friendly and based on true scientific principles, cannot help accomplishing good results. Therefore there seems to be all the more reason for having some high standard authority to pass upon all products before they are offered for use.

Professors A. Calmette and A. Delarde have, after considerable investigation, offered a new theory in relation to toxins and antitoxins. They conclude that immunity, natural or acquired, cannot be due to the presence in the serum of a chemical substance having the power to destroy or modify the toxins. "The true existence of a preventive substance in the serum of vaccinated animals remains yet to be proved; the authors' experiments suggest that the preventive power may after all be a physical and not a chemical phenomenon. Thus they have shown that the antitoxic

function is independent of immunity, since the latter can exist in the absence of the former ; further, that both natural and acquired immunity result from a special property of the cells. These, according to the conditions of the surrounding mediums and their own composition, yield passively to the influence of the toxins as a bar of soft iron does to that of a magnet. When these conditions change under diverse external influences, such as the tolerance of certain poisons, the functional state of the cells is modified at the same time. This may be compared to the conversion of the soft iron into steel by tempering ; the steel can preserve its magnetization, and transmit it temporarily to other bars of soft iron or permanently to other bars of steel. The authors maintain that a similar physical explanation can be offered of the susceptibility or temporary permanent resistance of organisms to infections and intoxications" (*Ann. de l' Institut Pasteur*, Vol. X., page 675).

Diphtheria and tetanus are the two affections which have been treated most largely by this form of treatment and in which the best results have been attained. As the prevalence of diphtheria is so great, and the mortality so large, especially in children, both abundant opportunities and comparative statistical results have been readily obtained. A very striking report of the prophylaxis of Antitoxin in an epidemic of diphtheria is made by a correspondent to the *British Medical Journal* from Rome, Italy, in which he states (Vol. II. for 1897, page 311) :

"Dr. Pasani, sanitary officer of Baricella, in the province of Bologna, has published an article in the *Rivista di Igiene e Sanità Pubblica* of July 1st on an epidemic of diphtheria, which broke out in the above town, which was arrested by preventive injections of the antidiphtherial serum. It states that the outbreak developed amongst a population of 5,500 persons in the worst possible hygienic and dietetic conditions. The first case occurred towards the end of October, 1896, and 57 others followed. Of the 58 cases, 54 were treated with serum procured from the Bologna Antirabic Institute, and there were 5 deaths, equal to a mortality of 8.6 per cent. From his observations, he believes the serum by itself alone is sufficient to cure the disease, and that even in very young children it is necessary to inject 1,000 I. u., and to repeat it in twenty to twenty-four hours if the local and general symptoms are not improved. The epidemic continued, sometimes lessening, at others increasing, notwithstanding the adoption of severe prophylactic measures—isolation, disinfection, closure of the schools for a time, etc. He,

therefore, with the consent and at the expense of the municipal authorities, had recourse to preventive injections on a large scale. These injections were made on four-fifths of the children of the poor, between 1 and 12 years of age, and the results demonstrated very clearly their value, both as regards the immunizing power of the serum and the duration of the immunity. When the epidemic was at its height he inoculated 260 children. From the second day (February 2d, 1897) following the injections up to May 15th, when he wrote the article, only 2 cases of diphtheria had taken place among them. Both cases were very slight; one occurred forty days, and the other two months after the injections. On the other hand, 15 cases of diphtheria and primary croup occurred between February 2d and May 15th among the children not subjected to the preventive treatment. The dose up to 2 years of age was 100 I.u., from 2 to 8 years 200 I.u., and from 8 to 12 years 300 I.u. To save time, owing to his having to inoculate such a large number, he injected the serum into the antero-external part of the arm. He sometimes noticed a cutaneous eruption around the inoculated point, and at others a slight œdema with a little pain, which disappeared in a day or two. He had not observed any internal disturbances from the injections."

Again, "In the *Berliner klinische Wochenschrift* for 1897, page 694, Dr. F. Rauschenbusch describes a most interesting case in which toxic symptoms followed a prophylactic injection of Behring's anti-toxic serum. There were two cases of diphtheria in the doctor's own house, and in order to prevent the extension of the disease to the other members of his household, each one (five in number) was injected with 200 units of antitoxic serum, all the five members being injected from the same bottle, which contained 1,000 units. In four out of the five there were absolutely no untoward results, but in one of the three children (a perfectly healthy girl) serious symptoms developed very rapidly. This child, aged 10 years, five minutes after the injection developed a marked eruption at the seat of injection. This eruption rapidly extended up the thigh and on to the right side of the face. It was accompanied by very great itching, and ten minutes later the whole body, especially the face, was covered with a dark scarlatinal-red rash, and the child fainted. A warm bath relieved the itching, but as soon as the child was taken out it again fainted, and remained in a collapsed condition until it was placed in a horizontal position. The radial pulse could not be felt on either side, and the heart, though regular, was exceedingly

weak. The pupils were dilated, and were sluggish. The child was sleepy, it answered slowly, and the skin was cold and pale. The scarlatinal rash soon disappeared, except on the face. Two hours after injection there was vomiting, after which the general condition of the patient improved, but the heart weakness remained. Eight hours later there was itching of the hands and feet, both of which, as well as the face, were swollen and oedematous. There was some swelling in the mouth, giving rise to difficulty in swallowing. The condition of the heart continued to improve, but at this period the radial pulse was still almost imperceptible. The urine, of moderate amount, was of a dark red color, but it contained no albumin. Next morning the heart was stronger, and the patient continued to improve. Dr. Rauschenbusch, while still believing in the efficacy of Behring's serum, comes to the conclusion that there must be individual predispositions which make it necessary that care should be exercised in administering this substance. It is interesting to observe, however, that the same girl two years before had been injected with 600 units during an attack of diphtheria, and that there had then been not the slightest reaction. The two younger children suffering from diphtheria also received 600 units, and were not affected in the slightest degree. It is evident from the whole history of this case, that for some reason or other hæmolytic changes had taken place with considerable rapidity. Whether this is due to peculiarities in the blood, to a want of coagulative power, or some similar condition, is at present a matter for careful consideration. This case is of very great interest to the practitioner who has to inject prophylactic doses of serum where diphtheria has obtained a footing in a household. Dr. Rauschenbusch's only suggestion is that the prophylactic dose should be diminished in amount."

It would take up entirely too much time and space to rehearse here even short abstracts of the very numerous reports that have been made throughout the year in the treatment of diphtheria alone—mostly in favor of the Antitoxin treatment. Every practitioner by this time is familiar with the complete report of the American Pediatric Society which sums up the consensus of opinion of all in this country, except a few who are still skeptical, and, therefore, possibly a general outline of the present state of professional feeling of the whole medical world may well be repeated here in the words of the editor of the London *Lancet* as it appears in Vol. I. for 1897, page 1621: "The testimony in its favor has been very large. It is true, however, that here and there skepticism lingers,

and figures have been quoted that seem to tell a different tale. Yet these contrary statements only serve to confirm the general opinion as to its value, for on scrutiny they are deprived of their significance. Thus in a monograph entitled *Die Serum-behandlung der Diphtherie*, which has recently appeared, Dr. F. Ganghöfner, of Prague, Bohemia, after detailing the facts advanced on all sides in support of the claims of the remedy, mentions that adverse opinions have been expressed by Dr. Sorensen, of Copenhagen; Dr. Kohts, of Strasburg, and Dr. Müller, of Halle. Dr. Ganghöfner, however, points out that in each instance conclusions have been drawn on too slender a basis and without adequate trial of the serum. Dr. Sorensen published two papers on the subject. In the first he contrasts his experience of 51 cases treated with the serum with 46 not so treated. In each series the mortality was 33 per cent., but believing that the injections favored a tendency to hæmorrhage, he seems to have used them with great caution, giving only small doses and often delaying the administration for days. Seeing that the success claimed for antitoxin mainly rests upon its earliest possible administration, and that, too, in ample dose, Professor Sorensen's negative results are not surprising. In a further return Professor Sorensen records 9 deaths in 80 cases treated by the serum, but only 5 deaths in 140 without serum, but here the fallacy of selection renders the comparison useless, since the serum group contained twice as large a proportion of severe cases as the non-serum group, and, moreover, in 8 of the 9 fatal cases the serum was not injected until the third to the fifth day. Professor Müller's figures from the Halle surgical clinic, showing a mortality of 50 per cent. after tracheotomy amongst cases treated by serum, and of 40 per cent. amongst those not so treated, are also open to the criticism that in three-fourths of the former class the injections were delayed until the fourth or fifth day, and in some were of very small amount. The figures of Professor Kohts, also based on the mortality after tracheotomy, showed but slight difference between the two classes, only his cases were too few in number to allow of any definite inference. Yet even here the mortality was much lower than the average for the preceding five years. But in all these comparative statistics there lurks the great fallacy due to the selection of cases submitted to antitoxin, some cases being untreated because of their mildness and others because the subjects were moribund on admission to hospital. This fallacy has been obviated in the statistics furnished by the medical superintendents of the hospitals

of the Metropolitan Asylums Board by contrasting the relative mortality of all cases in the year 1896 (including those in which antitoxin was used and those in which it was not used) with that obtaining in the year preceding the introduction of the antitoxin treatment (London *Lancet*, Vol. I. for 1897, page 1564). The results of that comparison will be found in our last issue, and we may remark that they harmonize with the admitted fact that as a whole the death-rate from diphtheria, not only in London, but in all great centres, has fallen since the introduction of the remedy. As regards these statistics of the Metropolitan Asylums Board attention should be particularly directed to the most striking reduction of mortality effected in those patients coming early under treatment—a fact in favor of the remedial action of antitoxin which is demonstrated with especial force in the case of post-scarlatinal diphtheria, where it was mostly possible to carry out the administration very early indeed.

“The utility of the treatment does not rest solely upon statistics, which, however carefully compiled, are open to fallacies due to the varied conditions which must of necessity prevail. It depends quite as much on the general consensus of opinion amongst those physicians who have fairly employed the serum that its use is followed by results no whit less certain than those which are ascribed to other drugs believed to have a specific action. Thus in prescribing antitoxin the physician feels sure of obtaining results as definite as those which ensue on the administration of quinine in ague or salicin in rheumatism. These effects consist in the main in the cessation of the spread of the diphtheritic membrane, its speedy deliquescence, together with a corresponding diminution in the intensity of the local inflammation. It is probably owing to this striking action of the arrest of the local process that under this treatment fewer cases of laryngeal diphtheria are now operated upon and that the percentage of recoveries after operation is larger than it was. How can this be explained except on the ground that the antitoxic serum acts directly upon the virus, preventing further mischief, although impotent to remove lesions already established by the poison? Nor can any objection to its use be based on the fact that certain complications seem to have become more frequent, for if through its agency in certain cases life is prolonged or preserved, it would be in these very cases that one might expect the effects of the original virus to be most manifest. It is gratifying to have the assurance of the medical superintendents of

the fever hospitals that in all their wide experience they have not met with any effects attributable to the injection itself which were of a nature to cause anxiety. It is true that since its general adoption there have been a few isolated instances of apparent fatal injury, but according to those who have investigated such cases they are one and all capable of other explanation. Even in the case of the most remarkable, and in its circumstances the most painful, of these, which occurred at Berlin last year, it is confidently affirmed that the fatal result must be attributed to cardiac paralysis excited by violent coughing from the inhalation of vomited matters in a susceptible subject, and not to the direct action of the serum or its injection. The subject is discussed in Professor Ganghöfner's monograph, where the grounds for this conclusion are entered into. The case referred to was the more distressing from the fact that the injection was being practiced, not for treatment, but for prophylaxis. It is, indeed, remarkable, considering the short time that has elapsed since the method was introduced, and the necessarily tentative nature of its application, that so large an amount of confidence should have been awarded to it. This fact by itself surely testifies to its efficiency, and encourages the hope that with time and experience still more favorable results will be obtained."

Dr. C. Compaired, of Madrid, Spain, reports (*Annal. des Malad. de L'Oreille, du Larynx, etc.*, Vol. I. for 1897, page 505), 7 cases of ozena treated by hypodermic injections of antidiphtheritic serum.

In regard to the treatment of tetanus by Antitoxin encouraging progress has been made during the past year. The general conclusions reached appear to be those of Dr. Nocard, which he stated at a meeting of the Paris Academy of Medicine on July 20th last. His evidence proved that a small dose of the highly virulent dry powder of antitetanic serum was sufficient to immunize a horse against a fatal dose of tetanus toxin. Its success for some years past in veterinary practice has been quite convincing. It has acted as a preventive in 3,100 animals where tetanus was endemic without a single death. Failure generally occurs if tetanic symptoms have been established, but success is the rule when injected very early in the attacks and previous to the tetanic symptoms. Dr. Nocard finds, however, that the injections should not necessarily be dispensed with in cases of established tetanus, for some success is to be looked for, and in fact is the very best method of treating this affection in horses—the attacks are less numerous and less severe, and if recovery is obtained convalescence is hastened.

The Antitoxin treatment in typhoid fever has not been very encouraging during the past year in this country and no doubt, therefore, reports have not been numerous. Foreign observers, however, seem disposed to claim remarkably good results from injections in healthy persons in epidemics of typhoid fever, such as occur in military camps. Definite reports in this direction will be awaited with interest. The latest reports on the subject of serum diagnosis of typhoid fever come from Dr. F. Widal, made at the International Medical Congress, held in Moscow in August last (*The Medical Week*, Vol. V., page 439).

As to anti-choleraic inoculations, some progress has been made during the year, especially abroad. The number of cases reported are too few as yet to draw any general conclusions, but a reduction of as much as 20 per cent. in the mortality statistics has been recorded, and gives good evidence that the results are at least not unfavorable.

No doubt Professors T. R. Fraser, of Edinburgh, Scotland, and A. Calmette, of the Pasteur Institute, of Lille, France, are diligently at work on the same subject of the serum treatment of snake bite, as alluded to here last year, but no further very extended reports have been made during the past year. The following is, however, "of interest in being one of the first cases of snake bite treated in India with Prof. Calmette's antivenene serum :

"About 6.30 P. M., on September 21st, a Hindu boy, aged 11, son of a groom, was drawing water from a well, and in returning accidentally stepped on a snake, which bit him on the right foot, the foot being bare at the time. Two men were with him who both saw the snake, but were unable to kill it before it disappeared in the grass. They promptly bound the end of a pugaree tightly round the boy's leg, and, picking him up, ran with him to my quarters. Not more than three minutes elapsed from the time he was bitten until I saw him.

"The typical imprint of a snake bite, with its two deep fang punctures and the crescentic row of small teeth marks between, was clearly seen on the inner side of the right foot. It being 'the hour at which men most do congregate at the club,' no fewer than five medical officers were on the spot in a few moments. I at once injected 8 c.cm. of Calmette's antivenene serum into the subcutaneous cellular tissue of his abdomen. At the same time Surgeon-Major Birt, A.M.S., treated the wounds and their immediate neighborhood with a hypodermic solution of permanganate of potash, after

which they were carefully washed and dressed. The case was then placed under observation and seen from time to time during the evening, but the patient never had a bad symptom, and is now running about as well as ever he was.

“REMARKS.—There is no doubt one weak point in the above case—namely, that the snake was not killed, and that, therefore, there might be an element of doubt as to the nature of its species. The reptile, however, was clearly seen by both men who were with the boy, who gave an accurate description of it, and recognized it as a krait (*Bungarus caeruleus*), that most deadly and dangerous Indian snake. The characteristics also of the wounds were clearly those of a bite from a snake with fangs. My own personal observation led me at once unhesitatingly to conclude that the injuries were caused by a poisonous snake, and in this I was borne out by the unanimous opinion of the five medical officers by whom the case was seen, several of them of long and varied experience in India. Taking all these points into consideration there can, I think, be little doubt that the boy was bitten, and bitten savagely and deeply, by a krait, a bite from which under ordinary circumstances is necessarily fatal.”

This case is related by Surgeon-Major S. J. Rennie, of Meerut, India, and will be found in the *British Medical Journal*, Vol. II. for 1896, page 1501.

The treatment of pneumonia with anti-pneumonic serum continues to be advocated by investigators and the further studies of Dr. E. DeRenzi, of Naples, Italy, will be interesting when published. It is to be hoped that they may have been as favorable as his 10 reported cases of last year. Those interested in this line of treatment should read the report of a case occurring in the Poplar and Stepney Sick Asylum just outside of London, England (*Brit. Med. Jour.*, Vol. I. for 1897, page 973).

Dr. Weisbecker, of Gedern, Germany, has carried on some interesting experiments with the serum obtained from convalescents after measles, especially children. Three were between 9 and 15 months old. In one case he injected before the rash appeared and obtained a decided modification of the regular course. In 4 cases of pneumonia complicated with measles he claims favorable results (*Zeitsch. für Klin. Med.*, Vol. XXX., page 312).

Like unsatisfactory results to those reported by Prof. Neumann last year have continued to be reported in the use of the serum of animals immune to syphilis when injected in patients suffering

from that affection. Prof. Doehle, of Cologne, Germany, however, claims to have not only discovered but identified beyond question the specific bacillus producing syphilis. Further reports may be looked for from him.

Dr. Juan de Dios Carrasquilla, of Bogota, Colombia, has continued his experiments with anti-leprous serum alluded to here last year and now reports on at least 100 cases of gratifying results. Dr. Pablo Garcia Medina, Secretary of the National Academy of Medicine at Colombia, verifies his results so that statements are now made which are so convincing that they cannot well be neglected. It is urgently recommended that all who have such cases to treat should procure this serum. To facilitate this end Dr. Albert S. Ashmead, of New York City, has considered the propriety of starting what he proposes to call a "Carrasquilla Institute." He has had several consignments of this serum sent him from Dr. Carrasquilla and intends to continue such importations. Those interested in this subject will read with interest Dr. Ashmead's letter to the editor of the *Journal of the American Medical Association* (Vol. XXVIII., page 181).

At a meeting of the Paris Academy of Medicine on September 28 last Dr. H. Hallopeau made a report on his experience with a like serum to that of Dr. Carrasquilla which was not favorable, although he concludes to continue the investigations despite the many difficulties encountered, showing he at least believes there is some prospect of reasonable success in the future.

Dr. J. Olaya Laverde, of Bucadramanga, Colombia, has sent to the Paris Academy of Medicine "a long communication on the serum treatment of leprosy. The method which he employs differs from that of the medical man at Bogota, inasmuch as he prepares his animals by means of subcutaneous injections of fluid from leprous tumors, which have just been removed from patients in an active stage of the disease. These animals always experience a well-marked general reaction, which disappears completely at the end of from five to six days. The blood of these animals, drawn when they have fully recovered their health, is collected with antiseptic precautions and injected in the ordinary way; accidents incidental to the operation are unusual and unimportant. On the first injection the patients show a pronounced febrile reaction, with malaise, pain in the back and the abdomen, and sometimes diarrhoea; this reaction commences six hours subsequent to the injection, and after an interval varying from twelve hours to three or six days, according to the

case, it terminates in copious perspiration, a general feeling of comfort, and recovery of appetite. The therapeutic results are very marked and extend to all the symptoms. The good effects on the nervous system, for instance, are shown by the disappearance of anæsthesia, wandering pains, palsies, and pains in the joints. The improvement in the condition of the mucous membrane is manifested by the renewal of nasal respiration, the disappearance of ozena, anosmia, and blepharitis, and the healing of conjunctival and corneal ulcers. The results on the skin are that perspiration returns, the hair on the scalp, the chin and the eyebrows grows afresh, extensive ulcers rapidly heal, and leprous nodules are absorbed. The bacilli which could formerly be found with ease in the parts of the skin infiltrated with leprous nodules also disappear. The duration of the treatment is from three months to one year at the most. The good effects observed have been fully maintained in sixty cases up to the present time, and six of the patients may be considered to be cured, as a year has now elapsed since their restoration to health, but time alone will show whether the success obtained is permanent, and whether the majority of the patients will be thoroughly restored to health or only improved. Ordinary therapeutic measures, such as the actual cautery, may be employed at the same time as the serum treatment; the patient's food and general hygiene should also be attended to. The author makes special reference to "lavages du sang," by which he means large injections either of normal serum into the cellular tissue or of artificial serum into a vein; these injections seem to be valuable adjuncts to the serum treatment." (*La Semaine Médicale*, Vol. 16, page 356.)

Cases of ulcerative endocarditis have been treated with serum, and have been recorded. Those interested will find them as follows: By Dr. Harrington Sainsbury, in the London *Lancet*, Vol. II. for 1896, page 1079; by Dr. A. E. W. Fox, in the same periodical, Vol. I. for 1897, page 520; by Dr. Margaret Pearse, in the same journal, Vol. II. for 1897, page 92, and finally Dr. J. W. Washbourn, in the same, Vol. II. for 1897, page 707. In this latter case the "antistreptococci serum was used, because it was thought that the case was most probably one of streptococæic infection, although we possessed no bacteriological evidence of the presence of streptococci in the blood."

Dr. Paul Paquin, of St. Louis, Mo., has been one of the most energetic and apparently successful workers in the treatment of tuberculosis with an anti-tubercle serum. At the recent meeting

of the American Medical Association in June last in Philadelphia, Pa., he reported on 67 cases in addition to those previously reported on since his work in this line began in 1894. He concludes as follows :

“ This report does not include the numerous cases in which serum was tried in moribunds or in more favorable cases for too short a time. Nor does it include a number of cases improved in the last few months by using serum by rectal injection.

“ In concluding this report, I wish to say that too much is expected of sero-therapy in tuberculosis, or of any treatment for that matter. It can never be possible to arrest consumption when the tissues are so destroyed and their generative energies so enfeebled that they are beyond the power of stimulation. It is only in the early stages that one may expect the best results (and in the early stages it is a most efficacious remedy). One great trouble we have to deal with is mixed infection, and this can be reached only by the use of antitoxins prepared specially for the germs producing the complications, assisted occasionally by other measures. Tubercle antitoxin can not act directly against microbial complications. Furthermore, it should not be forgotten that the destructive process of tuberculosis is so great, so comprehensive, that no means of wise special or general treatment should be spared to assist sero-therapy or any other special treatment in the work of repair. Most of them were cases of an experimental character. The cases which I have submitted here have been treated almost exclusively by the use of serum.

“ I am fully convinced that no one is warranted to-day in proclaiming the absolute and exclusive curative properties of an exclusive specific alone in tuberculosis of all kinds. Every case must be treated on its merits, considering in each the symptoms, lesions, predispositions, inherited conditions and the various susceptibilities present. Sero-therapy is nature's remedy and offers the greatest assurance of benefit in the subjugation of the specific cause or causes, but in most cases, as just stated, it should be supported in its splendid work by such hygienic, dietetic and medicinal measures as are considered wise for each individual case.” (*Journ. Amer. Med. Assoc.*, Vol. XXIX., page 98.)

Dr. E. A. DeSchweinitz, Director of the Bureau of Animal Industry, Washington, D. C., also reported his results in the same line as Drs. Maragliano, Babes, Behring and Paquin are working, at the same Philadelphia meeting of the American Medical Association.

He concludes as follows: "Our experiments lead us to conclude, that while the injections with tuberculin produce in healthy animals, a serum containing antitoxic material the amount of this is small; and that the injection of the live culture is the proper treatment. We cannot agree with the statements that horses are unsuitable for the work. Mules and donkeys may perhaps give quicker results, but horses seem to be entirely satisfactory. At no time have we found that the horse serum produces toxic effects, although these have been noted from the cow serum. If the antitoxic serum treatment for tuberculosis could be freed for the present from its commercial aspect, and careful systematic experiments continuously conducted in numerous hospitals and sanitariums, this or a similar modified method of treatment could be looked to for good results. When tuberculosis can be uniformly cured in guinea-pigs, as certainly as diphtheria, then does the commercial aspect become a fair and legitimate one. In the meantime the laboratory worker desires the intelligent co-operation of the clinician who will be desirous not only of curing his patient, but of advancing the theory as well as the application of those principles which, with the expenditure of many years' time and often at great personal risk, have been made intelligible." (*Journ. Amer. Med. Assoc.*, Vol. XXIX., page 113.)

Much attention has been paid and much interest centered in the attempted serum treatment of the recent outbreak of the bubonic plague in India. A good summary of the investigations made, and the deductions to be drawn, is given in the *British Medical Journal*, Vol. I. for 1897, page 1492, and is worth repeating here: "A striking instance of the value of antitoxic methods of prophylaxis is afforded by the results of Professor Haffkine's inoculations against the bubonic plague in India. On reading the description of his technique, which he has communicated to us, and which is given in full in another column, one cannot help being struck by the roughness of the methods employed, and by the wonderful success that attended them.

"That the introduction into the body of the mixture which results from the growth of the plague bacillus in a mass chemically so complicated as a mixture of native 'ghee' and bouillon should cause the inoculated to suffer to an extent about twenty times less than the non-inoculated, living under the same conditions and exposed to the same chances of infection, is indeed a remarkable fact. It would almost seem as if the old definition of a physician as

one who poured substances about which he knew little into the body about which he knew less, were exemplified in the modern scientific therapist. The results of the method, however, would appear to be successful.

“Where, then, are we to look for the explanation of the process? How shall we find the exact element among the many upon which success depends? If such striking results have followed and continue to follow the method, how much greater results may we expect to ensue when bacteriologists have succeeded in isolating from the complex mass of proteid and other elements of which such an antitoxic material must be composed, the essential body upon which the result depends? Truly here are vast fields of research, and a good hope that important results may follow the ultimate solution of the puzzle.

“Professor Haffkine prefaces his paper with the remark that the first condition to be fulfilled in carrying out laboratory work on a microbe is to become able to recognize it with certainty and to distinguish it amongst all others which in the course of the work may become associated with it, or substituted for it, and then proceeds to describe in detail the characteristic growth by which the plague bacillus may be unfailingly recognized.

“Here we have an allusion to a difficulty which besets the bacteriologist at every turn, and one which has, perhaps, caused more confusion in an already intricate science than any one of the many difficulties with which the path of the accurate investigator is strewn. Anyone who has tried to recognize from the descriptions given in the text-books a bacillus not previously encountered must have felt the great want that exists for differential characteristics. Microscopically many varieties of bacteria resemble each other closely; in culture they present differences which in many cases are small.

“The most beautiful instance of an accurate series of differential tests between allied organisms is exemplified in Klein’s classical series of distinctions between the *B. coli communis* and *B. typhosus*, a series of differential characteristics which must always remain the type of what is requisite in such cases. It is not too much to say that much of the confusion that exists in bacteriological literature is due to the want of such distinctive reactions. The mode of growth of the plague bacillus described by M. Haffkine seems to be very characteristic, and will apparently enable bacteriologists to recognize it with certainty.

“Having obtained a pure culture, the next process in the

preparation of the antitoxic material is to cultivate luxuriant crops of bacilli by adding to the nutritive medium abundant quantities of fat freely exposed to the air; the fat used is the native 'ghee,' or clarified butter. In the course of a month sufficient growth has formed. The microbes are then killed by heat and the inoculation fluid is ready. The whole process appears to be simple; the results, however, show it to embody the essential elements, for even in the first experiments made at the House of Correction at Byculla, out of 173 persons non-inoculated there were 12 cases and 6 deaths, while among the inoculated, who numbered 148, there were but 2 cases and no deaths. What this essential element in the process is it remains for future research to discover, but M. Haffkine is to be congratulated on the large measure of success which has already attended his investigation."

Commissions were sent to India from China, Germany, France, Italy, and, in fact, all the prominent nations, to study this important subject, and they have all returned with independent favorable reports based on separate investigations. Dr. Charles B. Fitzpatrick, of New York City, has published "A Preliminary Note on the Investigation and Preparation of the Antitoxine of the Bubonic Plague." (*N. Y. Med. Journ.*, Vol. LXV., page 490.) His series of experiments were undertaken in order to investigate, and, if possible, to prepare this Antitoxin, so that the Health authorities might be ready for any opportunities to make a practical use of it in this country.

Further prophylactic experiments have been tried by Prof. Koch on the production of immunity against the Rinderpest in Cape Colony, Africa. National prejudices have been prominent in discrediting his work not only in the English Colonies, where it has been tried, but by the French; however, he has undoubtedly obtained such gratifying results that time only will show the ultimate progress made in this line of treatment. A condensed report of Koch's work will be found in the *British Medical Journal* (Vol. I. for 1897, page 683). The editorial comment on this report is repeated here:

"It will be seen that Professor Koch has succeeded in obtaining from 'salted' cattle or cattle that have recovered from an attack of rinderpest, a serum of low antitoxic value, so low, indeed, that it requires 100 c.cm. of this serum to protect an animal against an inoculation with a small dose of rinderpest blood. Here, again, the immunity is passive and temporary. Such serum, though it

cannot be used on a large scale, may nevertheless be useful in certain cases, as by mixing 20 c.cm. of such serum with virulent rinderpest blood and then injecting the mixture, an immunity equal to that enjoyed by an animal that has recovered from a natural attack of the disease can be obtained, an immunity that is certainly active, and continues for some time.

“In a former note it was pointed out that Koch had been unable to find Simpson’s bacillus in the bile of cattle that had succumbed to an attack of rinderpest. Working with the bile of such animals, he now finds that a single injection of 10 c.cm. is sufficient to produce a high degree of active immunity, which, however, does not set in until about the tenth day; it is so decided, however, that four weeks after the injection of the bile, 40 c.cm. of active rinderpest blood—a twenty-thousandth part of which is a fatal dose—may be injected. This is a most important statement, and brings the protective inoculation against rinderpest into line with Haffkine’s prophylactic inoculation against the plague. The most noteworthy fact is that every farmer who has a case of rinderpest amongst his stock has at hand a quantity of material with which he may protect such animals as have not contracted the disease, or have not yet been exposed to infection.” (*Brit. Med. Journ.*, Vol. I. for 1897, page 673.)

Anusol is one of the newer products offered. It is claimed to be the Bismuth salt of Iodo-Resorcin-Sulphuric Acid, and is recommended abroad to control hyperæmia when present in the mucous membrane of the rectum and vagina. It has been tried with gratifying results in the form of suppositories in catarrh, fissures and pruritus of those regions. No definite clinical results are yet reported.

Apolysin—the combination of Phenetidin and Citric Acid—has been little reported upon during the past year. Dr. V. Jez administered it to 50 patients suffering from a dozen or more definite affections, in daily doses of 3 to 7 grammes (46.3 to 108 grains), and concludes that it is quite an indifferent article, possessing no analgesic properties whatever, and slight antipyretic and diuretic effects (*Wien. klin. Wochensch.* for 1896, page 466).

Argentamin (Ethylene-Diamin-Silver Phosphate)—the Silver Nitrate substitute—has not received much general attention in the medical world during the past year. The only mention of prominence is by Dr. A. Ascher, of Buda-Pesth, Hungary, in the *Deutsch. Med. Zeit.*, Vol. XVIII., page 14, where he records his experience

in 22 hospital cases of gonorrhea. Aside from the additional testimony of this number of cases, Dr. Ascher simply repeats and verifies what has previously been claimed.

Argentol is a new antiseptic recently introduced by a German firm. It is a combination of Oxy-Quinolin and metallic Silver. It is offered as a substitute for Actol and Itrol as being less stable and therefore more effective when applied to suppurating wounds, for the component parts are each energetic agents when presented to such surfaces. Practically all other silver preparations yield silver oxide when splitting up, whereas this component yields metallic silver in a finely divided state. It is reported to be so readily decomposed that if it is even brought to the temperature of 100°C. (212°F.) in water, finely divided metallic silver is deposited. It has been successfully used in syphilis, gonorrhea, open wounds, granulations, skin diseases and other like affections, in the form of a dusting powder, ointment, a mucilage and emulsion injection—the latter principally in gonorrhea. It is reported to be non-irritant and non-toxic. More detailed clinical results will no doubt follow later.

Argonin, the bactericide formed by mixing Silver Nitrite with a combination of Sodium and Casein, has apparently received more attention during the past year than the year previous. There seems to be a diversity of opinion now, however, as to its efficiency in the treatment of simple urethritis. Dr. J. Jadassohn, of Breslau, Prussia, claims that it is not adapted in these cases (*Archiv. für Dermat. und Syph.*, Vol. 32, page 179). Others recommend it. However, all observers who have made use of it admit its marked beneficial effects in both acute and chronic gonorrhea. When used of the strength of about 2 per cent., it is evidently a rapid and effective gonococcicide. Prof. Zydlovitsch reports favorably on his 33 cases of more or less chronic gonorrhea, believing Argonin superior to all other forms of medication.

Among other observers reporting in this country, two of prominence only will be mentioned: Dr. Frank Trester Smith, of Chattanooga, Tenn., reports on a case of gonorrheal ophthalmia with the following conclusions: "This case seems to indicate that argonin can be used safely in the eye; that it is less irritating than nitrate of silver, and from its wonderful effect on the discharge and the development of the gonococci it appears to be the ideal remedy in purulent ophthalmia. Further tests will demonstrate its true value." (*Journ. Amer. Med. Assoc.*, Vol. XXVIII., page 687.)

Dr. H. M. Christian, of Philadelphia, Pa., gives his views on the treatment of gonorrhea by injections of this agent, drawing these conclusions as to its value :

“1. That it is absolutely unirritating and can be used in solutions from one to ten per cent.

“2. In the great majority of cases it lessens the discharge very rapidly.

“3. Its use is generally followed in a short period by a disappearance of the gonococci.

“4. That this disappearance of the gonococcus is not in all cases permanent; in other words there is in quite a large proportion of cases a distinct tendency to relapse, with reappearance of gonococci.

“5. That it possesses distinct value as a hand injection in the stationary period of the disease, but is of very little benefit in the mucons stage, or stage of decline.

“6. It produced no results in the treatment of chronic anterior urethritis.

“The writer would state that he is still using it in his hospital services as an injection in the stationary stage of the disease, and is very much impressed by the remarkable power the drug seems to possess in so many cases of rapidly diminishing the discharge and causing at least a temporary disappearance of all gonococci.

“Should the price of the drug ever admit of its being used in irrigation of the urethra it may possibly be found to be of still greater value.” (*Therap. Gaz.*, Vol. XXI., page 447.)

Aristol (Annidalin) has lost nothing of its importance and usefulness during the past year. It continues to be quite generally used, but no definite reports have been made, for many surgeons now use it as a routine practice in suppurating wounds of most kinds.

Bananina is a coined name for a new product consisting of “a flour made from the plantain, a vegetable which is well known as a staple article of food in South America. It is said that in many districts of Cuba infants are fed with success on banana flour immediately after being weaned. It is stated to be made from the plantain by a simple process, and one which does not necessitate much handling. After the skin has been separated and the heart extracted the soft pith is artificially dried in ovens, ground and reduced to a fine powder, and having been sifted is ready for the market.

“It is of a white yellowish color. Under the microscope some black specks may be discerned. It has an agreeable smell, is soft

to the touch, and slightly sweetish in taste. Microscopically it is seen to consist entirely of starch, with the exception of a small amount of vegetable fibre and foreign matter. The starch is of a peculiarly soluble variety, and is rapidly converted by an artificial digestive mixture. The analysis given by the makers is as follows: Water, 10.62 ; albumin, 3.55 ; fat, 1.15 ; carbohydrate, 82.82 ; phosphoric acid, 0.26 ; salts, 1.60. From this it is seen that the product is essentially a starch food, and from the fact that the particular variety of starch of which it is composed is very soluble, it will doubtless prove of value where such food is indicated. The presence of an appreciable amount of phosphates adds to its dietetic value. It can be cooked in any of the ways usually employed for this class of material, and its pleasant taste should add to its utility." (*Brit. Med. Journ.*, Vol. II. for 1897, page 223.)

Benzacetin (Aceto-Amido-Methyl Salicylate) first recommended in the treatment of neuralgia, has received practically no consideration whatever in the current medical literature of the year past.

Benzonaphtol (β -Naphthol Benzoate)—the recommended intestinal antiseptic—has received no attention in the medical literature of the year.

Benzosol (Benzoyl Guaiacol) has not received much attention in the current medical literature during the year past. Only three articles of prominence are noted and they appear in the same publication but under different dates : Dr. Kofron, of Cleveland, Ohio, reports a case of a musician, 21 years old, affected with intestinal tuberculosis secondary to pulmonary tuberculosis in which marked improvement was obtained by using this agent. The second article was that of Dr. George Frank Butler, of Chicago, Ill., who writes (*The American Therapist*, Vol. V., page 169) simply of his personal experience, and concludes that its most important uses are "as an intestinal antiseptic, and as a remedy of great value in certain forms of tuberculosis." The third article is by Dr. Mark A. Brown, of Cincinnati, Ohio, who reports (*The American Therapist*, Vol. VI., page 48) his good results in phthisis. Testimony from others is recorded, simply confirming the above results.

Bismal (Bismuth Methylene-Di-Gallate)—the internal astringent alluded to here last year—has not been heard of in the current medical literature of the year.

Boral (Compound of Aluminium Borate and Tartrate), the alleged astringent and bactericide in the diseases of children, has received no attention in the medical world during the year. This

name is so much like Borol that confusion is surely encouraged by still continuing this very unwise practice of choosing names so much alike for new agents.

Borol is the short name given to a compound in which either Potassium (K) or Sodium (Na) join with Boron (B) to replace the two atoms of Hydrogen (H) in Sulphuric Acid (H_2SO_4), giving either of the two formulæ: $BKSO_4$ or $BNaSO_4$. It occurs in irregular, colorless, odorless, vitreous fragments, soluble in five times its weight of water. It is recommended by Dr. H. Jäger as having about three times the antiseptic efficiency of Carbolic Acid. A 2 or 3 per cent. solution rapidly destroys the staphylococcus pyogenes aureus, also the anthrax bacillus and the cholera vibrio. It has already been given internally in torticollis, epidemic cerebrospinal meningitis, croupous bronchitis, acute septicæmia and erysipelas, but with only moderate results. Given both externally and internally in erysipelas, psoriasis, chilblains, ozena and diphtheria, it shows about the same success. Little better results have been obtained when used externally in gonorrhea, burns, contusions and open wounds. In diphtheria (sprayed), gonorrhea and ozena a 1 to 2 per cent. solution was used. Internally 10 to 20 drops of a 20 per cent. solution diluted with water, 5 or 6 times a day is directed for children, and 30 to 50 drops for adults. It should be given to nursing infants midway between the feeding times as it coagulates the milk (*Therap. Wochensh.*, Vol. IV., page 204.).

Bromoform is still in prominent use, chiefly in the treatment of pertussis. Poisoning cases unfortunately continue to be reported, more frequently as its use becomes more extended. Dr. W. F. Cheney, of San Francisco, Cal., reports a case of interest in this connection, and may serve as a caution to those who are favorable to its use. A mixture containing this agent was given to a girl 3 years of age for pertussis. Two drops were calculated to be in each dose given, and they were to be taken every 4 hours. After she had taken the mixture quite regularly for about a week, always with good effect, she complained of the last dose about three hours after its administration. Her feelings were those of dizziness, and she speedily fell to the floor powerless. Her head dropped forward apparently without control. She was conscious and could talk, but her speech was thick and unintelligible. She acted as if she was intoxicated. She talked in a jolly way but disconnectedly and laughed without a cause. Very soon she vomited profusely, and then became unconscious. Her face was of good color, her pupils markedly

contracted, her respirations were 20 and regular and were not ster-torons, her pulse was 105 and regular but weak. Her breath smelled strongly of Chloroform. One one-hundred-and-twentieth of a grain of Strychnine was given hypodermically, after which she slept soundly for three hours, and was perfectly rational after awaking. Dr. Cheney adds that he has prescribed this agent frequently in a solution of alcohol, sugar and water without any ill-effects until this occasion. In the future he says he will administer the agent dropped on sugar, for in spite of all devices it appears to precipitate when given in a mixture.

Camphor is becoming searee in China, Japan and Formosa, and therefore it is specially interesting to learn that the U. S. Agricultural Department is looking into the subject of a prospective home industry. The Division of Botany of that Department has during the year issued its Circular No. 12 on the Camphor Tree. The distribution of this tree in this country is confined to the whole State of Florida, a strip along the Gulf of Mexico, to the Coast of California south of San Francisco, limited areas in southern Arizona and along the Rio Grande River. It is reported to be a hardy tree, needing practically no cultivation, and is quite ornamental. It yields its gum from the twigs and leaves, which latter are so abundant that judicious pruning, from time to time, will furnish an abundant supply of gum and yet will neither retard its normal growth nor spoil its symmetry and attractive appearance.

The only mention specially of note to the medical practitioner in the current medical literature of the year is the announcement of Dr. A. Herrgott that 200 milligrammes (about 3 grains) of Camphor, in the form of a cachet, given three times daily for three consecutive days produces a remarkable diminution in the secretion of milk. His experience is based on 30 cases. After making use of Antipyrin and the other usual anti-galactogogues with much dissatisfaction, he was led to try Camphor by the encouraging results of Prof. Kiener on milk cows and other animals (*Revue de Thérap. Médico-Chirurg.*, Vol. 64, page 280).

An artificially prepared form of Camphor called "Oxycamphor" has been experimented with both physiologically and chemically, and is reported to give promise in relieving dyspnoea brought on by certain conditions. It is prepared by reducing Camphor-Ortho-Quinon by means of powdered zinc and acid in a way which would be of little interest to describe here on account of its complicated organic reactions, but chemically considered it consists simply of

one molecule of hydroxyl (HO) replacing one molecule of hydrogen (H) in the formula of Camphor.

“It is a white, crystalline powder with a melting point of about 204°C. It is soluble in cold water to the extent of 2 per cent., but more so in hot water, and readily in all organic menstrua with the exception of ligrosin, the solution in water having a slightly hot and bitter taste. Solutions of albumin are not affected, but myosin is precipitated in flocculi. Oxycamphor is inimical to low forms of organic life, bacterial growth, putrescence, and fermentation being markedly retarded by a 0.1 per cent. solution and entirely stopped by a 0.5 per cent. solution. When added directly to blood oxycamphor causes the hæmoglobin to become converted into methæmoglobin, and otherwise appears to hinder the absorption of oxygen. When injected into the lymph sac of a frog oxycamphor behaves like camphor in paralyzing the muscular coat by acting on the motor nerve endings; the action of the two drugs on the heart, however, is dissimilar, inasmuch as camphor excites the movements when they have been arrested by muscarin, not only when applied by intravenous injection, but also when a dilute solution is sprinkled on the organ, so that it cannot cause coagulation of the myosin; oxycamphor, on the other hand, however applied, causes retardation, or even actual arrest, of the frog’s heart. In warm-blooded animals the difference in the action of the two drugs is even more remarkable, camphor producing in large doses mental excitement and rapid respiration from its irritant action on the fourth ventricle; whereas when 0.25 gramme is given to a dog subcutaneously or a gramme by the mouth the breathing becomes quieter, more regular, shallower, and very much slower. When 0.025 gramme is introduced into a vein the slowing of the respiration is very soon followed by its entire cessation, showing that the drug acts upon the respiratory center. The vaso-motor center is not affected, except secondarily through the respiration. Numerous experiments have shown that even long-continued and considerable doses do not set up any by-effects in other organs, so that oxycamphor would seem likely to prove a valuable therapeutic agent in dyspnoea due to circulatory disturbance. Ewald and Kuttner have made some trials with it, and have obtained results which are decidedly encouraging. They consider the dose to be from 7 grains to 15, and the quantity per diem from 30 to 45 grains.” (London *Lancet*, Vol. II. for 1897, page 404.)

Cascara Sagrada and its officinal preparations continue to be

experimented with to mask or counteract the disagreeable taste, and yet not alter its efficiency. Bitterless preparations are at present offered of varying efficiency, and now another is presented by an English pharmacist, Mr. L. C. Urban, who claims to obtain a palatable and aromatic fluid extract of Cascara possessing marked cathartic properties, by thoroughly mixing

Freshly Slaked Lime	100 Gm.
Ground Cascara Sagrada	1000 “
Ground Liquorice Root	150 “

then kneading the mixture with 1000 Cc. water. Macerate for 10 or 12 hours and then dry at 40° to 50°C. (104° to 122°F.) Next moisten with 400 Cc. of the following menstruum :

Alcohol	500 Cc.
Glycerin	250 “
Water	250 “

Pack a percolator and exhaust with this menstruum. Reserve the first 850 Cc. of the percolate, and evaporate the remainder to a syrupy consistence. Add the latter to the reserved portion together with 12 Cc. of Compound Spirit of Orange and make up the whole to 1000 Cc. with dilute alcohol.

Chinaphtol is a new intestinal antiseptic prepared by Dr. E. Riegler, of Jassy, Roumania, by combining Quinine and β -Naphthol—in full it is Quinine β -Naphthol- α -Mono-Sulphonate. It is a crystalline, yellow, bitter powder, insoluble in cold but slightly soluble in hot water and alcohol. It is not acted upon by acids, but alkalis split the base Quinine from the β -Naphthol Sulphonic Acid. This reaction is supposed to occur in the intestines, having passed through the stomach unaltered. It is strongly recommended in cases of typhoid fever, both of hospital and private practice, in dysentery, intestinal tuberculosis and in acute articular rheumatism (two successful cases are recorded). If the temperature runs over 40° C. (104°F.) 500 milligrammes (7.7 grains) is stated as the proper dose given frequently—as many as 10 doses during the day. With a more moderate temperature, 100 to 130 milligrammes (about 1.5 to 2 grains) doses are sufficient (*Wiener Med. Blätter*, Vol. 19, page 739).

Chinosol, the new antiseptic, disinfectant, deodorizer and bactericide of last year, still receives prominent attention. Besides those observers mentioned last year, others have investigated its valuable properties. Mr. A. A. Bonnema, of Apeldoorn, Holland,

is fully convinced that it possesses antiseptic properties and practically little toxic effects. It retards the decomposition of meat, checks both alcoholic and lactic acid fermentation, hinders the conversion of albuminous bodies into peptones and deters the coagulation of albumin. The results of his experiments on animals will be instructive to those interested in this agent (*Therap. Monatsh.*, Vol. X., page 663).

Dr. H. Ostermann, of Hamburg, Germany, has made good use of this agent in parenchymatous hemorrhages of the vagina and perineum, and in other gynecological operations, as well as in obstetrical practice—as an excellent bactericide (*Therap. Monatsh.*, Vol. X., page 154).

All the evidences go to show its far greater activity than Corrosive Sublimate and Carbolic Acid. It is now claimed to be chemically Potassium Oxy-Quinolin-Sulphonate.

A striking proof of its deodorizing property comes from an account of its effect at an English Kennel Club's Dog-Show recently held: "As a rule, dogs object to disinfectants which have an odor, but they had none to chinosol (which is almost odorless), and the committee reported that the chinosol was quite successful in keeping down the bad smell which invariably arises where a lot of dogs are kept together. The disinfectant is now offered in two new forms—(1) crude chinosol powder F, which is put up in a tin sufficient to make 1 gallon disinfecting-solution, which bulk for bulk is stronger than carbolic acid; (2) chinosol disinfecting-powder, a very light powder, which meets Professor Tichborne's essential—viz., capability of floating on water. Three new soaps are also introduced—(a) medicinal, containing 5 per cent. of chinosol; (b) veterinary, or dog soap, 3 per cent.; and (c) toilet, 2 per cent. These soaps are made from a superfatted, milled basis, without perfume, yet they have a pleasant odor owing to the chinosol, and are equally pleasant to use." (*Chem. and Drug.*, Vol. L., page 882.)

Mr. Percy Dunn, of West London Hospital, England, reports that, being encouraged by the results of previous investigators, he was led to test the properties of this agent and with very gratifying results, in which he verified all the previous claims—the greatest advantage he claims being its applicability as an *antiseptic for everything* (*Med. Press. and Circ.* of Dublin, Vol. CXIV., page 453).

Chloralose (Anhydro-Gluco-Chloral)—the hypnotic—is still largely used, and appears to have established itself permanently. When this stage is reached with a new agent there naturally is less

and less comment made in the current medical literature, unless either some phenomenally favorable or bad results are obtained. Only two articles of prominence have appeared during the year. Dr. James Tyson, of Philadelphia, Pa., publishes his accumulated results (*Univ. Med. Mag.*, Vol. IX., page 153) after being induced to try it on a patient with the most obstinate insomnia, for he had used ineffectively, Sulphonal, Chloralamide, Chloral, Trional and Paraldehyde. After administering 650 milligrammes (about 10 grains) at bedtime, he reports the effect as magical. His account of his cases is interesting and instructive, for he also alludes to disadvantages and some ill-effects. He concludes that this agent is undoubtedly best adapted to cases of simple insomnia, since it is not, in any high degree, at least, an analgesic.

Dr. S. Leon Gans, of Philadelphia, Pa., writes (*The Philadelphia Polyclinic*, Vol. VI., page 182) on "Chloralose; with a Report of Two Cases of Untoward Effects."

Chlorobrom (Equal parts of Chloralamid and Potassium Bromide) is still advised by some practitioners as a prophylactic in seasickness, but the preliminary directions continue to be prerequisite to success, and, therefore, the conclusion may still be drawn that such aperient preparation of the traveler may alone accomplish the desired result. Dr. M. Charteris, of Glasgow, Scotland, continues to urge the use of this agent (*The London Lancet*, Vol. I. for 1897, page 1146), but prescribes the same preparation as has always been found necessary.

Chlor-Phenols (Mono-and Para-Chlorphenol) have received little attention in the current medical literature of the year. The only mention of any note was that of Dr. Barbe, at a meeting of the Paris Society of Dermatology and Syphilography, held on March 11th last, when he reported his experiments in the treatment of lupus as follows: "At the Dermatological Clinique of the Saint-Antoine Hospital, I have experimented in several cases of lupus with chlorphenol in the form of 1 part of monochlorphenol to 5 parts of alcohol. The results of this treatment were very satisfactory, especially in a case of lupus vulgaris of the face of such extent that it was almost out of the question, in the beginning at any rate, to employ the galvanocautery, scarification or caustics. The chlorphenol solution was applied with a brush every other day for several months. At the end of five months there was marked improvement; at present a network of non-projecting scars is seen everywhere on the face, especially on the cheek. There still remain

several small patches of lupus, to which I propose ultimately to apply the galvanocautery, if the chlorphenol should not cause them to disappear." (*Medical Week*, Vol. V., page 130.)

Cinnamon has of course been long known as an aromatic, and of great value as a condiment, corrective and adjuvant. It is largely used particularly in the form of Cinnamon Oil to mask disagreeable odors and tastes in prescribing. It has long been thought by some as of much service either alone or conjoined with other medicinal preparations in obstetrical practice.

Within the last year Dr. J. Hilton Thompson, of Pendlebury, England, has published his observations on the use of the Oil in the treatment of consumption (*Brit. Med. Journ.*, Vol. II. for 1896, page 1374). He says: "My attention was first drawn to the essential oils through reading a paper by M. Chamberland, published in 1887. It appeared to me that if the oil of cinnamon possessed strong antiseptic properties, it was a drug likely to be of service in the treatment of pulmonary tuberculosis if used as an inhalation.

"I first used the drug as an inhalation in cases of tuberculous phthisis in 1892. I found the patients liked the smell and taste of the oil; it caused no irritation of the air passages, and did not interfere with the appetite; the progress of the disease was influenced favorably. My interest was further aroused in 1893 by a paper by Dr. Lucas-Championnière. Since then I have regularly prescribed inhalation of the *oleum cinnamomi* ver. in cases of consumption."

He then gives abstracts of "five cases, picked because they all had a well-marked phthisical family history, and were, moreover, treated under very unfavorable conditions. I felt that if in cases of this kind a favorable result could be achieved, the result would be still better when the family history and conditions of life were less bad."

He closes by giving the advantages as follows: "That oil of cinnamon, when used as an inhalation in certain stages of consumption, affects injuriously tubercle bacilli, is, I think, rendered probable by the very remarkable way in which, in the above cases, the organism diminished in numbers or disappeared from the sputum in a comparatively short time after commencing treatment. Also by the tendency for the disease to relapse when inhalation was discontinued. It appears probable that the oil of cinnamon tends to cure consumption in two ways: first, in the very early cases of catarrhal phthisis, by so directly affecting the bacilli as to stop their growth; and, secondly, in cases that are rather further advanced,

by only allowing organisms incapable of growth to pass along the bronchi, and thus prevent the infection of fresh lobules. In this way the disease may be limited to a small area, where it can be dealt with by the vital processes of the body, and cut off from the system by the formation of fibrous tissue, and so cease to be an immediate source of danger. Besides the five cases abstracted the drug was tried in the more advanced stages of the disease, but as might be expected, without any benefit.

“An interesting feature of the above cases was the order in which the symptoms subsided. The expectoration and the cough were the first to improve, then the temperature tended to the normal, and finally the weight began to increase. These favorable changes in the symptoms were accompanied by a gradual diminution in the number of tubercle bacilli in the sputum.

FORM OF INHALER.

“With regard to the form of inhaler used, I found that those in ordinary use served the purpose very well. If the patient were in an early stage of the disease, I endeavored to persuade him to use an inhaler that would cover both the nose and the mouth, but in the later stages, when there was shortness of breath, an inhaler covering the mouth only was used. I found that in the early stages of the disease particularly the patients liked the smell and taste of the cinnamon; they could use it most of the day and also at night with very little discomfort. It was also interesting to note that the continued inhalation of the vapor caused no irritation of the buccal cavity or of the air passages, and that no constitutional effects were produced.

“Of course, my experience with the oil is comparatively limited, but so far as it goes I have found the oil of cinnamon to have more points in its favor when used as an inhalation in the early stages of consumption, than the drugs that hitherto have been administered in this way and for similar objects.”

On April 19th last Dr. J. Carne Ross, of Manchester, England, wrote to the *British Medical Journal* (Vol. I. for 1897, page 1130), as follows: “In the article on Scarlet Fever, in the second volume of Professor Clifford Allbutt’s *System of Medicine*, recently reviewed in the *British Medical Journal*, at page 173, while dealing with the complications of that disease, the writer says:

“‘The treatment of the recognized complications of scarlet fever

is important. During recent months, while testing upon a series of cases the value of decoction of cinnamon—for which drug an abortive action had been claimed by Dr. Carne Ross in cases which could be brought under treatment at a sufficiently early date—I was surprised to find a considerable reduction in the incidence of some of the more common complications of the disease. Indeed in a series of 200 consecutive cases which were put under this treatment within twenty-four hours of the appearance of the rash, the incidence of adenitis, rheumatism, nephritis, and albuminuria was found to be about 50 per cent. below the average. The general death-rate, however, showed no reduction.’

“Whether rightly or wrongly, the complications of scarlet fever are greatly dreaded by the public at large, and a reduction of 50 per cent. in the incidence of these complications, following on the administration of cinnamon, is so fairly satisfactory a result, as I hope to justify me in asking you to allow me space in your columns to describe my method of treatment; and also to state as briefly as I can the general theory on which that treatment is based. Vaccination, which attempts to sterilize a patient against some disease by itself giving the disease in some altered form, suggested to my mind some years ago that it might also perhaps be possible, if you got a patient very early in any disease of microbic origin—so early that the microbe had not time to lay down a large cellar of ptomaines, if I may be allowed such an expression—that at this period of the disease it might be possible so to saturate the patient with some drug that had no selective action, and was absolutely non-poisonous, and could, therefore, be employed in enormous quantities, that he should practically become tanned or sterilized; and that if this could be effected, then possibly the microbe would cease to flourish, and if the microbe ceased to flourish, the disease might in consequence run a mild course. It seemed to me that, if successful, this method would have this advantage over inoculation, that it would be absolutely devoid of danger, and would possibly be equally applicable to any microbic disease.

“It is unnecessary to explain here why I elected to employ cinnamon, or why I took twenty-four hours from the onset of a disease as a time limit, and determined not to experiment on any cases where illness had existed for a longer period.

“Having experimented on a certain number of cases of influenza, measles and scarlet fever, and my results seeming to fulfill my expectations, I three years ago laid my views and the results I

seemed to have obtained before the late Dr. John Syer Bristowe, whom I had the happiness and privilege to number in the list of my personal friends. Dr. Bristowe, in reply, informed me that, as far as he was aware, the line of inquiry I was pursuing was entirely new, and that the results I appeared to have attained, he considered, demanded investigation, and that he had written to Dr. Caiger requesting him to carry out a series of experiments, to test the value of my work, at Stockwell Fever Hospital. This Dr. Caiger has done, and the result is stated above; and I desire to take this opportunity of expressing my deep sense of the obligation I am under to Dr. Caiger for his kindness in thus carrying out Dr. Bristowe's suggestion.

“With regard to these experiments, however, I would point out that the conditions met with at a fever hospital make it impossible to carry out the treatment perfectly, for patients rarely come under observation at such institutions till they have been ill for a good many hours, and, though a reduction of 50 per cent. in the incidence of the complications of scarlet fever above named is a satisfactory result, still, judging from cases of scarlet treated within the hours from the onset of disease, and also judging by analogy from what I have seen in cases of influenza treated within five hours from the onset of the disease as compared with those treated where twenty-four hours from the onset had elapsed, I believe it will be found that in camps, or in schools where careful supervision obtains, and where patients consequently might be subjected to treatment almost immediately after the onset of the first rigor; that a much better result than a reduction of 50 per cent. in the incidence of adenitis, rheumatism, nephritis, and albuminuria might be looked for, though that reduction for the present is good enough as it stands.

“I elect to stand or fall by the results of my treatment in scarlet fever, and, therefore, I refrain from speaking of the satisfactory results I seemed to have obtained in the treatment, by cinnamon, of measles and influenza; but with regard to the latter disease, I would merely say that during the last four years, I have never had occasion to pay more than four visits to any patient suffering from influenza who was subjected to treatment within twenty hours from the onset of the disease, and in not a single case have any complications occurred. The treatment is perfectly simple. I give half an ounce of decoction of cinnamon every hour for twenty-four hours; at the expiration of this period the same dose is repeated every two

hours till the temperature falls to normal ; when the temperature has fallen to normal, the same dose is repeated four times daily for three days.

“ If there is any sore throat, gargle or swab the throat every two or three hours with decoction of cinnamon ; in children the dose to be reduced according to age, but the same method of administration to be observed.”

He prescribes the method of its preparation as follows : “ A pound of Ceylon stick cinnamon in a sufficiency of water *in vacuo*, to be raised to 180° and kept there for a time, to be then slowly boiled till the fluid is reduced to a pint and a quarter ; pour off without straining ; 10 per cent. of glycerine being added, the preparation will keep for months.”

Citrophen (Phenetidin Citrate) has not received much attention during the past year. The only prominent mention is that of Dr. E. Homberger in the *Nouveaux Remèdes* for December 8th last, in which he states that he has found that 500 milligrammes (7.7 grains) rapidly reduces the temperature in tuberculosis without any secondary inconveniences. Also such a dose given four times in 24 hours has produced excellent results in acute rheumatism and neuralgia. It promotes the appetite and is agreeable in taste and odor.

Coca and its alkaloid have become more important to the surgeon as years have gone by, and it is interesting to read a report upon it from its native country. The following is quoted directly from Peru in *The Monthly Bulletin* of the Bureau of the American Republics issued at Washington, D.C. (Vol. IV., page 1121):

“ Prior to the discovery of cocaine and its wonderful anæsthetic properties which promoted the development of the export of coca, its consumption was limited to the demand from a few provinces in the neighborhood of mining districts, where nothing can be accomplished without it, for, when it fails, the laborers refuse to work. It is, therefore, an indispensable article for the exploitation of the mines of Peru. Thus we see, that in order to work the mines of Hualgayoc, it is necessary to take there coca cultivated at Cajabamba and Huamaleucho, situated on the banks of the Marañon river.

“ Twenty years ago the culture of coca was limited to the localities most favored by the climate and the low price of labor. In the province of Otuzco it was cultivated on a large scale, only on the farms of Choquisongo and Saniumas, which supplied the local consumption and that of the mining districts of Salpo and Sayapullo.

But an important change has since taken place in that province which is, to-day, the greatest producer in the north of Peru, exceeding Huamacho and Cajabamba combined, in quantity and quality, notwithstanding the fact that most of the trees are young and do not yield a full crop; that is to say, they do not produce as yet a quintal per thousand plants, as is the case with those over six years old. This quantity is the average of the crop per year."

A table follows showing the actual and approximate production of the one province of Otuzco and the number of plants there.

Cosaprin is the name given to the most recent antipyretic. It is prepared in Basle, Switzerland, by Dr. P. Schwarz. It is chemically closely allied to Acetanilid, but differs from it in being readily soluble in water and practically non-toxic. It is described as being simply a white crystalline mass, and Dr. Schwarz gives no intimation of the dose. Such meagre data are of little practical use at this time.

Creolin (Liquor Antisepticus)—1 part Resin Soap and 2 parts Crude Carbolic Acid, 20 per cent.—has not been alluded to in the current medical literature of the year, although undoubtedly it is still in use.

Creosotal (so-called Creosote Carbonate) has been little heard of during the past year except what has been furnished by the firm advertising it. The current medical literature has noted practically nothing.

Creosote has been used and commented upon considerably during the year. The attempts to avoid disarranging the digestion and to make it palatable have been quite a study. Success has not yet been completely attained. Cod-Liver Oil, Castor Oil and various forms of prescription have been extolled. A clear solution is now reported to have been obtained by mixing equal parts of Creosote, Castor Oil and Alcohol in Cod-Liver Oil. The following emulsion has been recommended as being the best method of exhibiting this agent, especially in children with irritable stomachs:

Beechwood Creosote....	48 to 126 minims.
Wintergreen Oil	10 “
Acacia.....	3 grammes (46.3 grains)
Glycerin.....	15 “ (231.5 “)
Cod-Liver Oil	up to 175 “ (about 6 ounces)

of which the dose is 5 grammes (one teaspoonful) one hour after each meal.

Dr. August Hock, of Vienna, Austria, not only recommends Cod-Liver Oil according to the following formula in the treatment of pulmonary tuberculosis in children, but in the persistent catarrhal sequela following measles and whooping cough :

Creosote	1.00	gramme	(15.4 grains)
Cod-Liver Oil	100.00	grammes	(about 3 ounces)
Saccharin	0.05	“	($\frac{1}{5}$ of a grain)

The daily dose is 10 to 45 grammes (2 teaspoonfuls) according to age, given with the meals (*Wien. Med. Blätter*, Vol. XIX., page 773).

Dr. Kopp, of Lyons, France, recommends (*Lyon Médical*, Vol. LXXXIV., page 354) the following formula made up in the form of wafers :

Beechwood Creosote.....	1	gramme	(15.4 grains)
Gum Benzoin	1	“	(15.4 “)
Powd. Vegetable Charcoal....	6	“	(92.6 “)

Triturate the Benzoin to a No. 80 powder with the Creosote, adding the Charcoal by degrees until the whole is uniformly triturated. The mixture may then be divided up into 5 or 10 wafers, which is well borne by the stomach.

Professors Romeyer and Testevin have advised a new form of exhibiting this agent containing 80 per cent. of it, and have called it “Creso-Magnesol” which is well suited to make up into pills. Its preparation is as follows :

Caustic Potassa.....	20	parts.
Water	10	“
Beechwood Creosote.....	800	“
Freshly Calcined Magnesia.....	170	“

The Potassa is dissolved in the Water and the Creosote gradually added and made into an emulsion, after which the Magnesia is intimately worked in. This mass darkens in color and is allowed to stand 36 hours, when it is suitable for making up into pills. Honey may be added to the mass later when it becomes so hard that it can be powdered.

Creosote Valerianate, called by the short name of “Eosote,” still continues to be a form of exhibiting this agent preferable to many for advantages claimed. Dr. Frank Woodbury, of Philadelphia, Pa., read a “Note on Two New Creosote Compounds: Creosote Valerianate and Guaiacol Valerianate,” before the Section of Materia

Medica, Pharmacy and Therapeutics at the Philadelphia meeting of the American Medical Association on June 3d last (*Journ. of Amer. Med. Association*, Vol. XXIX., page 465).

Creosote Phosphate has been strongly recommended, and it is claimed that large doses are well tolerated and without showing any toxic effects.

Dr. Levy, of Paris, France, recommends (*Journ. de Méd. de Paris*, Vol. 17 for March 17, 1897) among the formulas the following form of gargle :

Beechwood Creosote...	8 drops				
Tinct. of Myrrh.....	60 grammes	(about 2 ounces)			
Glycerin.....	60	"	(	"	2 ")
Water.....	120	"	(	"	4 ")

This has given him good results in follicular tonsillitis.

The following mixture is recommended by Dr. J. Molle, of Aubenas, France, to be given in 30 drop doses in a small quantity of milk daily by the rectum, to be increased up to 5 or 10 grammes (1 to 2 teaspoonfuls) :

Eucalyptol	5.0 grammes	(77.2 grains)			
Tinct. of Benzoin.....	25.0	"	(385.8	")
Balsam of Copaiba.....	40.0	"	(617.6	")
Creosote.....	12.5	"	(199.5	")
Sweet Almond Oil.....	17.5	"	(270.0	")

He has had excellent results with this mixture in bronchiectasis in children (*La Semaine Médicale*, Vol. 17, page 196).

The following paste is recommended by Dr. P. J. Unna, of Hamburg, Germany, in the treatment of lupus :

Salicylic Acid.....	10 grammes	(154.3 grains)			
Creosote.....	20	"	(308.6	")
Simple Cerate.....	15	"	(231.5	")
White Wax.....	5	"	(77.2	")

For hypodermic use in the treatment of tuberculosis, the following formula is recommended :

Beechwood Creosote ...	25.0 grammes	(385.8 grains)			
Camphor	15.5	"	(240	")
Aristol	9.5	"	(145	")
Eucalyptol.....	30.0	"	(463	")
Sterilized Neat's Foot Oil					
	up to 250.0	"	(about 8½ ounces)		

Dr. Theodor Zangger, of Zürich, Switzerland, has published his experience (*Correspondenz-blatt für Schweizer-Aerzte*, Vol. XXVII., page 361) in the treatment of gastric troubles, particularly infantile gastro-enteritis, with small doses of this agent. He refutes the claim that the larger the dose the better the result, particularly in phthisis, for his experience as well as others goes to show that often the best results are obtained with minimum doses. He claims the small doses simply act beneficially on the gastric digestion in putting it in a better condition to do its work in a normal way, and thereby improve the nourishment of the whole system. He suggests the following formula :

Beechwood Creosote . . .	3 drops
Alcohol	1 gramme (15.4 grains)
Distilled Water up to . .	100 grammes (about 3 ounces)
or a Mucilage up to . .	100 “ (“ “)

5 grammes (1 teaspoonful) to be given to children and 15 grammes (1 tablespoonful) to adults, before each meal.
 “ Black coffee or mint tea may be employed, if necessary, to disguise the taste. Where infantile diarrhoea exists without vomiting he has often found creosote valuable. In the milder forms of the vomiting of pregnancy small doses of creosote have always produced an improvement, and he thinks that even in severe cases a trial of the same treatment should be made.”

Dr. Peter Kaatzer, of Rehburg, Prussia, recommended last year (*Therap. Monatsh.*, Vol. 10, page 265) an Extract of Coffee as a corrective of the taste and smell of Creosote proper in the treatment of pulmonary tuberculosis, and it may be well to just make this mention here so that it may be referred to if desired. He finds this form of administration far preferable to pills, capsules or any of the compound forms.

Dr. James K. Crook, of N. Y. City, contributed an article to the Section on General Medicine of the Second Pan-American Medical Congress held in the City of Mexico on November 18th last, on “The Present Status of Creosote in the Treatment of Pulmonary Tuberculosis, with an Analytical Review of Forty-five Recent Cases” (*N. Y. Med. Record*, Vol. 51, page 433), in which he concludes :

“The foregoing review of the literature of creosote, together with his personal experience with the remedy, leads the author to formulate the following conclusions :

“1st. Although the human race continues to sicken and die of pulmonary tuberculosis, it is the consentaneous voice of the medical profession, as shown by reports gathered from all parts of the world, that we have in creosote a remedy capable of arresting a certain percentage of cases.

“2d. This drug should therefore be administered carefully, systematically, and continuously in every case of consumption, provided it is well tolerated and there is no contraindication or idiosyncrasy as to its action.”

Prof. Thoma, of Geneva, Switzerland, has published an article on “Creosote in the Treatment of Pleuro-Peritoneal Tuberculosis in Children,” in which he advocates his treatment to avoid the customary laparotomy, and concludes as follows :

“Of course it is inexpedient to generalize from two cases, especially as these children were not very ill and were treated promptly ; but, keeping in mind the comparatively short duration of the treatment and the necessity for preserving the appetite and the digestive functions as unimpaired as possible, it seems to me that enemata of cod-liver oil and creosote are well tolerated and give good results.” (London *Lancet*, Vol. I. for 1897, page 159).

Dr. Angelo Casati, of Camerata Picena, Italy, (*Gazz. degli. Osped. e delle Clin.* First half of Vol. 18, page 463) reports that he has found Creosote to be not only an antiseptic against the pneumococci, but a stimulant to the heart and nerves. His results were obtained from treating some 26 cases of acute pneumonia during a serious epidemic of that affection. He only records the details of one case—a man of 70 years of age—who recovered after beginning the treatment on the third day of the attack. The other cases were treated either with Creosote alone or conjoined with digitalis or caffeine in small doses. In giving it alone he used the following prescription :

Beechwood Creosote.....	1 part
Tinct. of Gentian.....	2 parts

given with a little wine in doses from 25 to 150 drops a day. He concluded that those cases receiving simply the Creosote and gentian recovered more rapidly and completely than those treated with the addition of the digitalis or caffeine.

Dr. Schoull, of France, reports what he considers to be perfect results obtained by Creosote enemata in the treatment of broncho-

pneumonia. This has been his practice since 1893. Although agreeing with Dr. Casati in the main, Dr. Schoull dissents from his mode of administration, for he does not approve of the large doses which seem to be necessary. The stomach, in his observation, does not tolerate such doses, and an intolerance and gastric derangement occurs very early. The intestines, however, do show a remarkable tolerance to large doses, even to as much as 4 grammes (61.7 grains) thus proving the advantage of the enema form of administration.

Dr. York Moore, of Stony Hill, Island of Jamaica, West Indies, writes to the *British Medical Journal* (Vol. I. for 1897, page 1332) on his success in the treatment of malaria by Creosote combined with Quinine, as follows :

“On former occasions communications have appeared in the *British Medical Journal* advocating the use of creosote rubbed into the axilla, and quinine administered in suppositories in cases of malarial fever. From the results I have obtained I am inclined to believe that very satisfactory effects may often be secured by a combination of these two treatments. I have frequently confirmed Surgeon-Lieutenant Rogers’ statement that within two hours of the epidermic application of creosote the temperature drops very considerably, in some cases becoming normal in a few hours and showing no tendency to rise again, in others remaining at about 100° F. or 101°, or intermitting between this and normal. In this latter class of cases I have found that quinine administered *per rectum* (commencing when the lowest temperature is reached, after administration of creosote, which it is probably useless to repeat more than once during the same defervescence) in doses of 20 to 30 grains at first, then 10 grains every three or four hours, will speedily check the fever, usually, as has been previously pointed out, without causing any signs of cinchonism, and obviously without upsetting the digestion. I am also inclined to believe that quinine enemata may aid in checking simple diarrhea in those cases of fever where this symptom occurs chiefly as the result of a congested liver, but shows a tendency to continue after that organ has received appropriate treatment.

“In private practice suppositories are doubtless the most convenient form for exhibition, but small enemata containing the quinine dissolved by the addition of just sufficient dilute sulphuric acid are quite effectual, sometimes more accessible, and possibly more efficacious in cases in which there is a tendency to diarrhea.”

Dr. Vladimir de Holstein, of Paris, France, reports very favorably on his treatment of chronic constipation by this agent when administered according to his plan. His first case was a young girl who had been treated for chlorosis with the usual iron and arsenic preparations and who was suffering from an obstinate constipation which would not respond to the usual forms of treatment. He began with a single drop of Creosote in a glass of either wine and water, or beer, milk or water alone, given twice a day after the two meals—not including breakfast. After the patient had become accustomed to taking this dose, the drops were gradually increased up to at least 7 or 8 until the proper action was obtained. This treatment was diligently continued for several months without any apparent ill-effects and surprised Dr. Vladimir de Holstein by responding almost immediately in producing a daily movement without other assistance. Thus encouraged he continued this treatment in other patients and now is able to report on a large number of cases in which all were relieved and no ill-effects encountered. He urges that Creosote does not therefore necessarily possess purgative properties but evidently is capable of destroying some toxic intestinal micro-organisms which in these obstinate cases check the digestive processes throughout the alimentary tract.

Dr. Asmus, of Russia, reports (*Medizinskoie Obosrenie*, Vol. XLV., page 944) his 58 cases of successful treatment of acute gonorrhea by injecting an emulsion of 2 to 10 parts of Creosote in 1000 of water. He rarely encountered complications and his recoveries were more rapid than with other methods.

Cutol (a compound of Aluminum Borate and Tannate), alluded to here last year, has not been heard of either in the old country or in this throughout the year, and probably has been discarded as of little value.

Dermatol (Bismuth Subgallate) continues to be largely used. Its efficiency to the surgeon as a substitute for Iodoform is well recognized, for it is odorless, styptic, non-irritant and non-toxic. Its application on gauze is very serviceable. Its use internally is now becoming more general. Being tasteless as well as odorless it is not objectionable to patients. Several observers have obtained good results in the treatment of all forms of diarrhea, whatever the cause may have been, in which it is safely given in doses from 500 milligrammes to 2 grammes (7.7 to 30.9 grains) in water twice a day. Its tendency to constipation may be obviated by glycerin

enemata. Dr. Perlmutter has had very good results in diarrhea and gastric ulcers.

In the new edition (fifth) of the Russian Pharmacopœia about to be issued this agent is among the additions to be officially recognized.

Dextroform is a combination of Dextrin and Formaldehyde, prepared by Prof. A. Classen, of Aix-la-Chapelle, France. It is closely allied in composition and therapeutic effects to Amyloform (Starch and Formaldehyde). This led Dr. P. Bongartz to make successful use of it as an antiseptic injection in the Mariahilf Hospital in Aix-la-Chapelle, in the treatment of gonorrhea, cystitis and in washing out an empyemic cavity. A solution of from 5 to 20 per cent. according to circumstances was employed. It is next to Amyloform in advantages over Iodoform (*Muench. Med. Woch.*, Vol. 44, page 585.)

Diuretin (Sodio-Theobromine Salicylate) is still receiving prominent attention, but the only definite allusions of particular value during the year were two. Dr. Nestor Tirard, of London, England, delivered "A Lecture on The Diuretic Treatment of Renal Dropsy" at King's College Hospital in which he speaks at some length on a case in which this agent was used. He concludes as follows :

"It is obviously unsafe to draw conclusions from one case, and it is no part of my purpose to-day, gentlemen, to attempt to reconcile these different statements. It must be a sufficient satisfaction to find that in the case before us great relief was obtained after we had used diuretin in place of other remedies, and that this relief of urgent symptoms coincided with the excretion of an increased quantity of fluid. In the early days of our employment of diuretin the asthmatic attacks first yielded, and afterwards we noticed that the amount of dropsy became considerably less. That the benefits obtained from this mode of treatment were not mere coincidences is shown by a slight return of asthma when, the patient having become accustomed to the use of the remedy, the amount of fluid excreted again became reduced ; and you will have seen how the asthmatic seizures passed off at first with an increase in the amount of diuretin administered, and subsequently after the employment of digitalis in addition to the diuretin. I do not consider that the treatment is likely to produce any lasting beneficial effect. In all probability we shall have, sooner or later, to relieve the pleura

again by aspiration, and perhaps to relieve the tension in the extremities by acupuncture or by Southey's capillary tubes. But these measures we endeavor to postpone as late as possible, since frequently the strength fails rapidly after draining large quantities of fluid from the extremities, and there is always some risk of exciting inflammatory changes in the neighborhood of the punctures." (*Brit. Med. Journ.*, Vol. I. for 1897, page 705.)

The second prominent allusion was the report of Dr. Steiner, of Rosenberg, Prussia, on his good results in acute renal inflammation. He administered according to the following formula :

Diuretin 5 to 6 grammes (77.2 to 92.6 grains)

Water 180 " (about 7 ounces)

Simple Syrup. 20 " (about 5 drachms)

the dose being 15 grammes (1 tablespoonful) every other hour. Diaphoresis was produced by the Sodium Salicylate element in the split-up compound, and the dropsy was materially reduced. As a diaphoretic in acute nephritis then this agent should be observed further by others.

In the new edition (fifth) of the Russian Pharmacopœia about to be issued, this agent is among the additions to be officially recognized.

Eka-Iodoform is a new substitute for Iodoform and is said to be a mixture of Paraform and Iodoform—thus improving the antiseptic properties, it is claimed. Its marked advantages are its complete sterility and freedom from irritating effects.

Dr. Thomalla, of Berlin, Germany, has used it with good results in about 100 cases, and recommends it whenever Iodoform would be applicable (*Therap. Monatsh.*, Vol. XI., page 381).

Electrozone—the name given to the antiseptic solution which is reported to be made up of Sodium, Magnesium, Calcium and other Hypochlorites—has not been heard of in the current medical literature of the past year, although it has been well-known that such solutions have been offered for some time past in this section of the country at least.

Ethyl Bromide (Hydrobromic Ether) is still elung to by a few surgeons, and undoubtedly continues to give good results in their hands, but it is none the less treacherous. One report deserves repeating here as it appears to be a fair statement. It comes from Dr. W. H. Kelson, of Queen street, Cheapside, London, E.C., England :

“When cases requiring small but painful operations have to be summarily dealt with, as in the out-patient department of a large hospital, ether, chloroform, cocaine, and the various sprays are liable to prove unsuitable anæsthetics, either from the time they take, the vomiting they cause, the after-attention required, or their inefficiency. Nitrous oxide gas is, of course, not open to these objections, but over it bromide of ethyl C_2H_5Br . has the great advantage of portability and simplicity as regards the apparatus required for its administration.

“On the all-important question of safety, reviewing the work of Silk, Chisholm, Terrier, Cumston, Roaldes, and others, and especially of the more recent writers, the verdict would seem on the whole decidedly in its favor.

“The following cases are of course too few to influence this question either way, but are cited as examples of small operations for which it proved quite sufficient. The notes on each case were made immediately after the administration, and I was assisted by Dr. Leon and Mr. P. Williams, senior dressers at the London Hospital :

“7 cases removing nails or parts of nails.

“6 “ breaking down adhesions.

“4 “ scraping sinuses.

“1 case partial circumcision.

“2 cases scraping carbuncles.

“1 case scraping small patch of lupus.

“1 “ removing tonsils.

“Specimens of the liquid varied in efficiency. One, which had been kept some time, had to be abandoned as it seemed quite ineffectual, but had not changed color. Another was of a brownish tint, presumably from free bromine, but it had not the suffocating odor of that liquid, and acted well.

“The method of administration was as follows : About a drachm and a half of the bromide was poured on the sponge of an Ormsby's inhaler, and the latter applied. There was very little tendency to excitement or struggling, and in about 60 seconds the cornea became insensitive and the breathing snoring. The inhaler was then removed and the operation proceeded with, the patient showing signs of returning consciousness in a variable period, but certainly averaging over 60 seconds.

“Vomiting occurred in two cases, but seemed to depend chiefly on the distended condition of the stomach. In these cases the

inhaler had not been reapplied, but in two in which this was done there was no vomiting, but the patients seemed more exhausted afterwards.

“In five cases rigidity came on immediately after the cornea became insensitive. This, in the case of tonsillotomy, interfered with the introduction of the gag, and the inhaler had to be reapplied.

“In the case of one subject, afterwards found to be addicted to alcohol, the bromide having been administered for 60 seconds without any signs of anæsthesia supervening, seemed suddenly to take effect, and great rigidity, rapid breathing, and some lividity were produced, which, however, rapidly passed off.

“The respiration was, as a rule, regular, and the pulse somewhat quickened. The recumbent posture in all cases was the one adopted.

“The patient’s ages varied from 7 to 40. The younger ones took it most readily. All the cases felt well enough to depart within ten minutes of the administration, though some hysterical symptoms appeared in two whilst recovering.” (*Brit. Med. Journ.*, Vol. II. for 1896, page 1711.)

Ethyl Chloride (Muriatic Ether), although undoubtedly much in use, has not been mentioned in the literature of the year in the way of any new applications.

Eucaine (methyl ester of benzoyl-methyl-tetra-methyl- γ -oxy-piperidin-carbonic acid) has grown rapidly in importance and efficiency, and a great deal has been reported upon it from all over the world. It would be quite impossible to spare the space here to even enumerate the reports upon it, but it will have to suffice to state that practically all reports extol its virtues. The advantages previously claimed for it and alluded to here last year appear to be pretty fully verified. The question of toxicity seems to be a little in doubt. Some claim it is quite equal to and others that it is less toxic than Cocaine. A mixture of equal parts—32 milligrammes ($\frac{1}{2}$ grain)—of the Hydrochlorates of Cocaine and Eucaine with 4 grammes (61.7 grains) of distilled water has been found to give better anæsthetic results, and may be tolerated in larger quantity than Cocaine Hydrochlorate alone.

Its use in minor surgical operations elicit the most favorable reports, even to the statement that it produces the most complete local anæsthesia of any agent offered up to this time.

Eucaine is claimed to be superior to Cocaine as a local anæsthetic injected into the urinary apparatus. Dr. S. Alexander, of New

York City, however, has reported that in using it in one case of internal urethrotomy it produced such intense irritation of the mucous membrane that he felt obliged to abandon it.

In dental surgery, equally favorable reports are abundant. It is found that 5 drops of a 10 per cent. solution injected into the gum before extraction of a tooth was sufficient to render the operation painless. If the affected teeth are scattered, and more than one is to be removed, a little more of the solution may be necessary. It is reported that as many as 21 roots and 10 and 14 teeth respectively were extracted without pain at one sitting. Eucaine appears to be effective in periostitis where Cocaine frequently fails.

The rhinologists, laryngologists and aurists have made remarkably good use of this agent in their practice. The slight irritation noticed at times being the only drawback, and this is only temporary. Dr. H. L. Armstrong, of New York City, recommends the following throat spray as almost a specific in acute inflammation of the upper air passages :

Eucaine.....	0.650 grammes (10 grains)
Cocaine Hydrochlorate..	0.650 “ (10 “)
Distilled Water	175.000 “ (6 ounces)

In ophthalmological practice a 2 per cent. solution has at times been found as active and even as irritating as a 10 per cent., but does not last quite so long nor is it as complete, however several applications of a 2 per cent. solution often acted as well as a 10 per cent., but complete anæsthesia is not produced quite as rapidly. Some observers report that they can see no advantages over Cocaine, and in their belief Eucaine will never supersede the former. However, such criticisms are comparatively few.

Dr. Thos. H. Shastid, of Galesburg, Ills., reported on February 6th last “A Case of Temporary Amblyopia from Eucaine” (*Journ. Amer. Med. Asso.*, Vol. XXVIII., page 323) as follows :

“The new succedaneum for cocain—eucain—has, I believe, proved so useful and so nearly free from danger that its continued employment is not a matter for doubt. I have frequently used it in cases where its points of difference from cocain have seemed to indicate its employment in preference to that drug, and I have often been struck, in such cases, by its excellences.

“Recently, however, there fell to me an experience of a kind to teach us that eucain certainly has its dangers. The case was that

of a man, a physician, aged 32, who came to me with a moderately large hypertrophy of the anterior extremity of the right inferior turbinated bone. Ordinarily, before applying galvano-cautery to the turbinated bones, I produce anæsthesia with cocain. In this case, however, from the fact that the hypertrophy was seated so far forward, I did not think it necessary to produce the shrinking of tissue that follows the use of cocain, and hence merely secured anæsthesia by means of eucain. The strength of the solution I used was 5 per cent.

“Immediately after the cauterization, the patient complained that his sight was growing dim, and a few minutes later, he said that it had entirely left him. There were no strongly marked constitutional effects, though the pulse was rather rapid and the patient seemed talkative and a little incoherent. The amblyopia was of exceedingly short duration, having almost entirely disappeared at the end of four hours. Neither while it continued nor afterward were any changes perceptible by the ophthalmoscope. The return of vision has been perfect and permanent.

“I have read of at least one case of amblyopia from cocain, but as yet no other case from eucain has come to my notice.”

Admitting for the moment that Eucaine was only equal to Cocaine in its anæsthetic effects, a marked advantage which it possesses is particularly recognized by the ophthalmologist and that is a solution may be sterilized without decomposition and thus be kept almost indefinitely—in fact be kept actually indefinitely, for the sterilization may be repeated by boiling from time to time.

The Eucaine first introduced and which most practitioners have been more or less familiar with, has now to be designated as “Eucaine A,” for a “Eucaine B” has been introduced and Dr. P. Silex, of Berlin, Germany, has experimented with it. It is described as the Hydrochlorate of Benzoyl-Vinyl-Di-Aceton-Alkamin and closely allied to Tropa-Cocaine and Cocaine. However, it is not irritating and is less toxic even than “Eucaine A.” A 2 per cent. solution dropped in the eye produces a rapid local anæsthesia and only a slight redness of the conjunctiva. Only slight irritation is noticed by some patients, for it is neutral or only slightly alkaline in reaction.

This agent undoubtedly has a great future before it.

Eucasin, the new food compound, similar to Nutrose, and obtained by passing ammonia gas over Casein obtained from milk, has not been commented on during the past year.

Euchinin (Euquinine) is a new compound of Quinine introduced by a well-known German manufacturing firm as possessing marked advantages over its relative. It is reported to be produced by bringing together, under certain conditions, Quinine and Ethyl Chlor-Carbonate resulting in the substitution of a molecule of Ethyl Carbonate for a hydrogen atom in Quinine. It is presented in the form of small colorless, needle-like crystals which melt at 95°C. (203°F), sparingly soluble in water but readily in alcohol, ether and chloroform. It is basic in its action and alkaline in reaction, forming definite crystalline salts with acids. The hydrochlorate is most soluble, the sulphate next and the tannate practically insoluble. Its marked advantages over Quinine are its practical freedom from taste (unless held long on the tongue, and then it is only slight), freedom from buzzing in the ears, headache, nausea or disturbed appetite, thus meriting its name Eu=good Quinine.

Clinically it has been used in the same class of cases as Quinine would be indicated, but is found to be equivalent to half the quantity therapeutically. As much as 1 to 2 grammes (15.4 to 30.9 grains) have been given to healthy persons without showing any bad effects.

Prof. Carl von Noorden, of the Municipal Hospital at Frankfort-on-the-Main, Germany, has made close observations with this agent (*Centralbl. für innere Med.*, Vol. 17, page 1225), particularly in 15 cases of pertussis, 14 cases of hectic fever in phthisis, 5 cases of fever of septic origin, in pneumonia with delayed resolution, enteric fever, and in several cases of neuralgia. To children and even to adults it is agreeably prescribed in sherry, milk, soup or cocoa. The tannate is the preferable form on account of its insolubility. Its effects in neuralgia are not yet sufficiently established to report definitely.

Eudoxin (Bismuth salt of Nosophen) is still being employed both in the old and in this country. The reports upon it have not been numerous during the past year, but the general testimony of those who have reported is that it is one of the best of the bismuth salts as a gastro-intestinal disinfectant. If more practitioners in this country would publish their results with it in the current journals, the profession could draw more definite conclusions than at present.

Europphen (Iso-Butyl-Ortho-Cresol Iodide)—the Iodoform substitute, containing 27.6 per cent. of Iodine—has been little com-

mented upon during the past year. Dr. Seibel Nolda is said to recommend the following formula in the treatment of burns :

Euophen	1 part
Vaseline	10 parts
Lanolin	10 “

This is to be applied vigorously 3 or 4 times a day.

Dr. L. Nied, of St. Elizabeth's Hospital in Vienna, Austria, makes use of the following formula in the treatment of ulcers of the leg (*Wien. klin. Rundschau*, Vol. XI., page 221) :

Euophen	3 parts
Vaseline	50 “
Lanolin	50 “

He acknowledges this to be rather weak and sees no objection to increasing the strength up to 10 per cent. of Euophen. He also made good use of a dusting powder mixed as follows :

Euophen	1 part
Finely Powd. Boric Acid	1 “

He rehearses 12 cases, 10 of which were chronic ulcers of the leg in middle-aged and elderly women. All the ulcers healed promptly and no irritation of the surrounding tissues occurred. His results were better with the dusting powder than with the ointment.

Exalgin (Methyl-Acetanilid)—the analgesic—has been practically unheard of in the medical journals during the past year, although it is known to be used still to some extent. Bad effects are recorded by some practitioners, but those who are successful with it recommend divided doses repeated frequently and finally increased to full doses.

Ferratin (Acid Albuminate of Iron) has not been commented upon in the medical literature of the past year as frequently as the year previous, however it is still in use and the enterprising firm who is handling it keeps the profession well posted as to its claimed superiority. It may be of some significance to many that the present Committee of Revision for the approaching fifth edition of the Russian Pharmacopœia recommend this agent for introduction into that standard work. It is still claimed that it very closely approaches the natural iron compounds found in the system and in the food products usually eaten, therefore is explained its marked property of rapid absorption, and its freedom from constipating effects.

Ferripyrin (Ferropyrin), the hemostatic compound consisting of 64 per cent. Antipyrin, 24 per cent. Chlorine, and 12 per cent. Iron, has not been heard much of during the year just past. Dr. O. Schäffer's claims for it alluded to here last year have not been quite verified, as others state that equally good and more lasting results have been obtained by the use of other measures. The outlook for this compound is not very encouraging.

Ferrostyptin (the name given to a new antiseptic and hemostatic to replace solid chloride of iron) has not been found in the current medical literature of the year and thus has probably gone into early retirement.

Filmogen is the name given to a new form of collodion recently described by Dr. E. Schiff, of Vienna, Austria. It is simply Pyroxylin (soluble Gun Cotton) dissolved in Acetone and a small proportion of Castor Oil added to render the film to be formed flexible. In fact it is quite the same as the U. S. Pharmacopœia official Flexible Collodion, only Acetone is used as a solvent in place of the mixture of Ether and Alcohol. The dermatologists naturally find it a most useful agent, as its solvent properties for most of the medicaments they use is great. Acetone at present is a cheaper solvent than Ether and Alcohol, and therefore if the product so produced will stand the test of time in the practitioner's hands equally, if not better than the present official Collodion, it should be recognized in this country. The excellent solvent properties of Acetone and its complete applicability in this connection have been known in this country for somewhat over a year, but the Pharmacopœia does not yet recognize it.

It may be interesting in this connection to mention that the best solvent known, at least for Pyroxylin, is Methyl Acetate.

Fluoral (Sodium Fluoride) recommended as a superior antiseptic and with less toxicity than Corrosive Sublimate has not been reported on in the current literature of the year. Undoubtedly it still has some good claims for urging its antiseptic properties. It has long been known that Hydrofluoric Acid (HF) acts quite energetically in resisting fermentation, and it has been claimed that a solution of 1 to 1,000 or 1 to 500 is not much inferior to Corrosive Sublimate in such uses as a surgeon would make of it in the treatment of open wounds.

Potassium Silico-Fluoride (KSiF_6) in solution under the name of "Salufer" (alluded to here last year) has been previously claimed

as practically non-toxic and powerfully antiseptic. Its non-toxic properties, however, have been refuted.

Now Drs. Hallion, Lefranc and Poupinel have called attention to the marked superiority of Mercury Silico-Fluoride (HgSiFl_6) over Corrosive Sublimate as an antiseptic (*Comptes Rendus hebdom. des Séances et Mémoires de la Société de Biologie*, Vol. III. of series 10, page 208).

This reference is a year old, but is recorded here in connection with the above comments.

Formalin (40 per cent. Solution of Formaldehyde)—the now well-known antiseptic, disinfectant, deodorizer and germicide—has received very prominent attention all over the world during the past year. This attention has been quite universally well merited, for practically nothing but praise for its usefulness comes from all medical men who have employed it. The literature and comments during the year have been quite overwhelming as far as a brief comment is concerned, so that little can be mentioned here except in a general way. As an intestinal antiseptic it apparently has taken the lead over all others—by some it is claimed even to be the ideal antiseptic. Naturally it appeals most to the surgeon, but the general practitioner also finds an increasing number of applications. The most striking is in disinfecting and deodorizing rooms, clothing, etc., by means of the specially constructed lamp for vaporizing it. There are now many of these lamps on the market, and the number is rapidly increasing, for so many interested parties think they have a valuable idea to introduce in the lamp and thus modify those already offered. One of the simplest takes the form of an ordinary Bunsen burner with very slight changes exteriorly. Of course interiorly it, as well as all those in the market, has for its general principle about the same construction of a platinum hood or mantle over which passes the vapor of methyl alcohol (wood alcohol) while the hood is heated to incandescence, producing the Formaldehyde vapor. The other forms of lamp take on various shapes, some of them quite artistic, making something of an ornamental piece for household uses. Naturally simplicity and substantial construction should be aimed at, particularly when long and frequent use is expected of it, as is the case in hospitals.

A 10 per cent. solution of Formaldehyde has recently been successfully used for embalming. The injection acted as a perfect preservative for a trip across the Atlantic Ocean. The caution is given that the embalmers should use rubber gloves.

Dr. Thomas S. Cullen, Resident Gynecologist of The Johns Hopkins Hospital, Baltimore, Md., has made a second report of his several years of experimental work on "A Rapid Method of Making Permanent Specimens from Frozen Sections by the use of Formalin." As this report has evidently elicited widespread interest, this writer is pleased to lend his aid by increasing its circle of interested readers by quoting this second report here in full :

"In April, 1895, I published two methods under the above title in the *Bulletin*.

"Since then, numerous requests have been made for reprints or for copies of the *Bulletin* of that number, and as the supply is exhausted, it has been thought best to publish the article again with one or two minor alterations. The methods have been continuously employed in the Hospital, and especially in the gynecological department, and have proved uniformly satisfactory.

"A complete freezing outfit has been placed in close proximity to the operating room, so that as little delay as possible may occur in examining a specimen. For example, if a carcinoma of the uterus is suspected, the patient is brought to the operating room prepared for hysterectomy. The uterus is curetted and the scrapings are examined while the usual preparations for abdominal section are being made. By the time all preparations are completed the diagnosis is given ; if negative, the patient is returned to the ward with the assurance that there is no cause for alarm ; if positive, the organ is immediately removed. The woman is thus saved from taking an anæsthetic twice, and avoids the period of anxious suspense of four or five days generally required by the ordinary methods to ascertain whether she has malignant trouble or not.

"Any one who has hardened tissues in formalin will be impressed with the rapidity of its action, with the firm consistence of the tissue, and with the absence of the contraction of the specimen so often seen when alcohol is used as the hardening medium. Microscopical examination of a specimen hardened in formalin, as we all know, shows almost perfect preservation of the cellular structure. Recently it occurred to me that formalin might be used in the preparation of frozen sections.

"One of the greatest difficulties experienced in rendering frozen sections permanent lies in the fact that when passed through alcohol the section frequently not only contracts but contracts irregularly, distorting the specimen ; further, such specimens will often

stain imperfectly. The use of formalin will obviate these difficulties, allowing one to make an excellent permanent specimen from the frozen section. My method is as follows: The tissue to be examined is frozen with carbonic acid or ether and then cut; the sections are then placed in 5 per cent. watery solution of formalin for 3 to 5 minutes, or longer if desired; in 50 per cent. alcohol 3 minutes, and in absolute alcohol 1 minute. The tissue is now thoroughly hardened and can be treated as an ordinary celloidin section, being stained and mounted in the usual way. On examining this mounted section one might readily take it for a well preserved alcoholic specimen. Supposing we stain with hæmatoxylin and eosin, the entire process is as follows:

“*Method I.* a. Place the frozen section in 5 per cent. aq. sol. formalin for 3 to 5 minutes.

“b. Leave in 50 per cent. alcohol 3 minutes.*

“c. In absolute alcohol 1 minute.

“d. Wash out in water.

“e. Stain in hæmatoxylin for 2 minutes.

“f. Decolorize in acid alcohol.

“g. Rinse in water.

“h. Stain with eosin.

“i. Transfer to 95 per cent. alcohol.

“j. Pass through absolute alcohol, then through either creosote or oil of cloves, and mount in Canada balsam.

“The blood is lost in frozen sections. To overcome this Prof. Welch suggested that the specimen be first fixed in formalin and then frozen. I tried this and found that we were able to preserve the blood, but that it did not stain very distinctly. For convenience this second procedure will be called method II. The essential factor is the same in each case. The latter process, however, requires at least two hours. A small piece of the tissue is thrown into 10 per cent. solution formalin for two or three hours. It is then put on the freezing microtome and thin sections can be readily made. The sections are stained in the usual way. The detailed procedure of method II. is as follows:

* The slight modification of Method I., recently suggested by L. Pick, *Centralblatt f. Gyn.*, Bd. XX, S. 1016, 1896, I cannot recommend. When first experimenting with formalin, among other procedures I tried staining the sections after hardening in the formalin and before placing them in alcohol, as Pick now suggests. The results were fair, but the definition so obtained was not to be compared with that gained by first passing through 50 per cent. and absolute alcohol for the short period. I accordingly abandoned it and did not think it worthy of publication.

“*Method II. a.* A piece of tissue 1x.5x.2 cm. is placed in 10 per cent. aq. sol. formalin for 2 hours. Rinsed in water.

“*b.* Frozen sections are made.

“*c.* Left in 50 per cent. alcohol 3 minutes.

“*d.* In absolute alcohol 1 minute.

“*e.* The sections are now run through water and stained in hæmatoxylin for 2 minutes.

“*f.* Decolorized in acid alcohol.

“*g.* Rinsed in water.

“*h.* Stained in eosin.

“*i.* Transferred to 95 per cent. alcohol.

“*j.* Passed through absolute alcohol, then either through creosote or oil of cloves, and mounted in Canada balsam.

“For ordinary use method I. is all that is required. Given a piece of tumor from the operating room, it is possible to give as definite a report in 15 minutes as one would be able to give after examining the alcoholic or Müller's fluid specimens at the expiration of two weeks. Method II. is of especial value in the examination of uterine scrapings. Instead of putting them in the 95 per cent. alcohol in the operating room, they may be immediately dropped into 10 per cent. aq. sol. formalin. By the time the pathologist receives them, which is at least two hours afterwards, they are firm enough to be frozen without difficulty, and permanent sections can be immediately made. The second method is to be recommended for all delicate tissues. In employing these methods one must remember, as for example in epithelioma, that some of the cell-nests will drop out, there not being anything to hold them *in situ*, as there is when celloidin is used. We have, however, hardened and stained epithelioma of the cervix by this method without the slightest difficulty.” (*Johns Hopkins Hosp. Bulletin*, Vol. VIII., page 108.)

Most practitioners who make use of photography in their profession, which, by the way, has lent so much towards the interest and preservation of valuable records, have undoubtedly already had their attention called to the various photographic applications of this agent, although protected by a patent. Its most valuable property is that of hardening gelatin. A 5 per cent. solution of Formalin applied to a film of gelatin and allowed to soak for about ten minutes and then washed and dried can be treated with boiling water for some length of time without being at all softened. As it seems

to have no ill effects upon the progress of development nor upon toning, except that of somewhat prolonging those operations, it will be found to be a valuable substitute for the more troublesome and less efficient alum.

A new form of combination is now offered called Formaldehyd-Casein, which is simply a condensation product of Formaldehyd and Casein having similar properties to Glutol. It is described as a coarse yellowish powder with a very slight taste and odor. Dr. Edgar Bohl, at Dorpat, Russia, has published his series of observations in 25 cases (*Muench Med. Wochsch.*, Vol. XLIII., page 889). This note is a little old but is interesting in this connection, and therefore is recorded here. The Formalin was used in the form of powder in tampons and on gauze in the same class of cases as Glutol has been employed. Special advantages over Glutol were apparently not claimed.

Formopyrin, the name given to the new combination of Formol and Antipyrin which was predicted to act as an antipyretic, anodyne and antiseptic has not been heard of during the past year.

Gelante is the name given by Dr. P. J. Unna, of Hamburg, Germany, to a new skin dressing composed of Gelatin and Tragacanth, and prepared as follows: "Pieces of gum tragacanth are macerated for a month in twenty times their weight of water; then they are exposed for a day to the action of steam, with occasional stirring, and finally strained through muslin. The same weight of gelatin is softened in water and submitted to the action of steam under pressure; the two masses are next mixed, and the mixture exposed to the action of steam for two days; it is then again pressed through muslin and receives the addition of 5 per cent. of glycerin, a little rose water and 0.02 per cent. of thymol. The liquid thus prepared contains 2.5 per cent. each of gelatin and tragacanth. When spread upon the skin it dries rapidly and forms a pliable varnish. Considerable quantities of medicament may be added to this basis; as much as 50 per cent. of ichthyol, 40 per cent. of salicylic acid, resorcin, or of pyrogallol, 5 per cent. of phenol and 1 per cent. of mercuric chloride. Bodies which are incompatible in aqueous solutions, such as salicylic acid and zinc oxide, ichthyol and various salts are without action on each other when incorporated with this basis. The property of drying very rapidly distinguishes gelante from all other water-soluble dressings, and from the large amount of water it contains it exercises a marked

cooling and refreshing action when applied to the skin ; it is capable of combining with fatty bodies, and can be applied cold to the surface. It promises to be a valuable addition to dermato-therapeutics, particularly in the treatment of eczema and psoriasis." (*Pharm. Journ.*, Fourth Series, Vol IV., page 417).

Glutol (Formalin-Gelatin) has had a large and increasing use which still continues, generally with successful results. It, however, has its special applications in which its antiseptic properties are considered the best of any agent offered to the surgeon. Its powdered condition offers the most attractive and effective form, and far the best results have been obtained when used thus. The most complete clinical study of this agent on suppuration in wounds yet made and which has been published since this time last year was accomplished by Dr. E. M. Foote, of New York City, in the Vanderbilt Clinic of the College of Physicians and Surgeons, New York City. He gives an interesting record of some 36 cases and draws the following impartial conclusions :

" Unsatisfactory as these brief descriptions are, it must be plain, even from their perusal, that the formalin has some antiseptic action. That was evident enough to one seeing the cases. But it fell far short of the point where one could say that it rendered a suppurating wound sterile. It seemed rather to control the infection for two days ; and if the character of the wound was such that this respite was enough to insure its closure, the result was perfect. If not, then whatever gain was made in the first two or three days was maintained, and the wound went on with its customary granulating from that point. This, however, is a distinct advance over the usual treatment. At the end of the second or third day, instead of having a wound distended to its full size by the gauze-packing put in at the operation, one finds, on removing the dressing, a wound perhaps united altogether below the skin—at the worst half united ; so that the time, until complete cicatrization has taken place, must be reduced by several days.

" A second point in favor of this treatment with formalin-gelatin is that it does away with the necessity for drainage. If the abscess-cavity is large, and there is purulent or serous fluid to escape, it finds its way out readily enough by the side of the mass of gelatin, while the grains of the latter, softened by the fluid, form in themselves an excellent capillary drainage. It was only in one or two cases, in which the abscess was small and superficial

and the incision a very short one, that a dried scab prevented discharge.

“ This brought up the question whether some other powder would not answer as well as formalin. To test this I selected acetanilid, and used it in a half dozen cases, as I had used formalin. It does not readily mix with water, and so it was more unsatisfactory to rub into a wound ; but the patients told me that there was no pain after the dressing was put on, whereas there is more or less pain with formalin for four or six hours. The wounds looked so well on the second, and sometimes on the third day, that I had almost concluded that formalin-gelatin acted merely mechanically ; but they suppurated, with scarcely an exception, in the course of a few days.

“ In no case treated did I succeed in getting primary union of the skin. It seems impossible that Schleich obtained an immediate union of the skin-edges, as, unless they are stitched together, they invariably retract a little. The ideal treatment of an abscess would be to sew it up again, but that is not possible until a more perfect antiseptic is obtained than formalin-gelatin proved in my hands. None the less, it seems to mark a distinct advance in the treatment of suppuration, giving the most perfect results in those cases where the cellulitis is moderate and the pus abundant.” (*Med. News*, Vol. LXIX., page 546.)

Guaiacetin (the new compound offered as a substitute for Creosote and Guaiacol in the treatment of pulmonary tuberculosis) has not been commented upon in the current medical literature of the year past.

Guaiacol (the chief constituent of Creosote) and particularly its Carbonate have been very largely and successfully used throughout the past year. Much has been written upon these, and especially the latter. Previous observations have in general been fully verified and the many additional applications have simply been natural deductions from previously recorded results. It would be impossible to even record here all the comments of the year, but a sufficient number will be noted to emphasize its practical usefulness.

As might be expected it has had its largest use in the treatment of tuberculosis, by external and internal application, by injection and in conjunction with Iodine—all of which were alluded to here last year as being successfully employed the previous year.

At a meeting of the Section of Medicine of the Royal Academy of Medicine in Ireland held on November 20th last Dr. Drury read

a paper on "Guaiacol in Pyrexia" "in which he drew attention to the uses and modes of use of guaiacol, but selected the method of epidermic application recommended by Rondet in 1895, as a means of reducing temperature, superior to either internal administration or by hypodermic injection. By this method 1 to 10 minims were rubbed into the skin, previously washed, and the part covered with oiled silk. About fifty cases have been so treated. The conclusions arrived at were (1) as a rule, no ill-effects follow its use; in one case of enteric fever in a female, after the use of $\mathfrak{M}\times$ on five successive evenings, collapse occurred several hours after the fifth application; the collapse was recovered from; (2) it very rarely fails to cause a fall of temperature, the fall being greater when the temperature is high than when it is only moderate in degree; (3) the fall reaches its maximum generally about one hour after administration, and is maintained for several hours; (4) after its use the skin becomes moist, and the patient generally sleeps; (5) it does not seem to have any effect on the course of the disease which is the cause of the fever; (6) it seems to act on pyrexia, no matter what the disease may be which causes it; (7) it usually increases secretion of urine, diminishes the night sweats of phthisis, and often relieves the cough; (8) cardiac failure appears to be the only contraindication to its use. A series of cases were then given in illustration. Most of the cases were used merely as test cases, the drug not being used as an ordinary line of treatment. Its routine use was not recommended, but for exceptional cases, where temperature is itself a danger, it is considered in most cases safe as well as a simple and pretty certain method of reducing temperature." (*Brit. Med. Journ.*, Vol. II. for 1896, page 1715).

The discussion which followed brought out prominently that this agent was not only very useful but also very dangerous.

Dr. Pierre Wagon reports (*Gaz. hebdom. de Med. et de Chirurg.*, Vol. 44, page 484) excellent results in the treatment of erysipelas after applying once or twice daily from 1 to 2 Cc. (about 16 to 32 minims) of this agent, for at times as striking a fall in temperature as four degrees in two hours resulted. The general condition of the patient improved also. Too sudden a reaction is fraught with danger, but if care be taken about the dose the danger is slight.

Dr. J. F. R. Appleby, of Washington, D. C., records (*Boston Med. and Surg. Journ.*, Vol. CXXXVI., page 258) his results with

“Guaiacol in Puerperal Eclampsia,” giving an account of two cases and concluding as follows: “Both of the above cases had albuminuria and were much swollen, which symptoms demanded treatment for a few days. Both made good recoveries, and are now enjoying ordinary health.

“For guaiacol there may be claimed certainty of action, speedy relief of urgent symptoms and ease of application which renders it perhaps more desirable and less objectionable than any one of the remedies heretofore used in eclampsia.

“In neither case did I find it necessary to make a second application, but would certainly have done so had it been necessary.”

Dr. E. K. Morris, of Sturgeon Bay, Wis., writes to the Editor of the *Medical News* (Vol. LXX., page 57) on “Guaiacol in Rhus-Poisoning” as follows: “August 16th last I was called to see a patient, male, aged forty-five years, suffering from an aggravated form of rhus-poisoning, the face being swollen to such an extent as to wholly obliterate the features, and the eyes being entirely closed. I made an application of zine-oxid ointment, and ordered applications of carbonate of sodium 3 ii in aqua 5 iii on absorbent cotton. Result negative. Third day after onset I made an application of pure guaiacol, freely painting it over the inflamed area with a camel’s-hair brush, and then covering the parts.

“Next day there was marked amelioration of the trouble, and on the fourth day after inaugurating the guaiacol treatment, the poisoning and its resulting inflammation had entirely disappeared.

“Again, on October 7th, I was called to treat a boy of eleven years with the same trouble, one side of the face and neck being affected to about the same extent as the previous case. I used the same treatment as before, *viz.*, guaiacol, and on the second day thereafter he was out and at school, the trouble having entirely abated.

“Some two years ago I was led to try this drug in the treatment of erysipelas, having received a monograph on the subject from Dr. C. J. Whalen, of Chicago, and with good results, which was my reason for experimenting with it in the above two cases of rhus-poisoning.

“Of course, these being the only cases in which I have had an opportunity of using this treatment, it would be premature to claim the guaiacol a specific; yet it certainly seems to have been of good service.”

Dr. Colleville, of Reims, France, reports (*Centralbl. für innere Med.*, Vol. 17, page 1306) good results as a local anæsthetic after hypodermic injections of about 30 drops of a mixture of Chloroform 5 parts, Guaiacol 3 parts as a substitute for the usual morphine injection in such affections as neuralgia, neuritis, rheumatism and to relieve the pain resulting from fractures.

Dr. J. E. Newcomb, of New York City, read a paper before the American Laryngological Association at the Annual Meeting in Washington, D. C., on May 4th last, on "Guaiacol as a Local Anæsthetic in Minor Operations on the Nose and Throat," in which he concludes :

"From no point of view can it be maintained that guaiacol is superior to cocaine. I have made no such statement, but have sought to fairly record clinical results. Guaiacol requires for absorption a much longer time than does cocaine. In oily solution, at least, it is more difficult to prepare and less agreeable to handle. To some few people its odor is disagreeable.

"In the cases thus far reported, numbering, with my own, ninety-eight in all, not the slightest constitutional effect (much less a dangerous one) has been noted. The anæsthetic effect is less certain than that of cocaine, but where, for any reason, the latter is inadmissible, guaiacol is in the majority of cases a reliable substitute." (*N. Y. Med. Journ.*, Vol. LXVI., page 276.)

Various compounds of Guaiacol are now prominently in use. One of the principal ones is Guaiacol Valerianate, or so-called "Geosote." Dr. Frank Woodbury, of Philadelphia, Pa., read a paper before the Section of Materia Medica, Pharmacy and Therapeutics of the American Medical Association at its Annual Meeting in Philadelphia, on June 1st last (*Journ. Amer. Med. Association*, Vol. XXIX., page 465) in which he closes as follows :

"I have found the guaiacol valerianate of decided value in the treatment of the so-called catarrhal state, which is sometimes considered as the pre-tubercular stage of phthisis pulmonalis. It seems especially suited, when properly diluted with some bland oil, for intra-tracheal injection in cases of advanced phthisis, with or without ulceration in the larynx, or cavity in the lung. Inhalations of creosote in combination with oil of peppermint is claimed by Dr. Carasso, to cause a disappearance of the tubercle bacilli from the sputum, and he reports good results clinically after nearly ten years' experience with it. Certainly, the form of aerial medi-

cation is worthy of extended trial, and guaiacol valerianate would be preferable to creosote for this purpose. I am of the opinion that we have in guaiacol the best remedy known at present to counteract the pernicious activity of the tubercle bacillus, and I may repeat the words of Dr. Jacobi: 'No one treatment of all forms of tuberculosis ever satisfied me to the same degree as has that of guaiacol.' When introduced into the stomach, the guaiacol valerianate is decomposed and the effects of pure guaiacol, with the sedative action of valerianic acid, are simultaneously obtained, which may be expected to have a favorable effect on the nervous manifestations of the disease, reducing cough and restlessness. In pneumonia, Malderasco used applications of guaiacol to the thorax posteriorly, over the affected area of the lung, with reduction of temperature and a diminished mortality."

Foreign observers have experimented with this compound and find it of value. Among those who have made definite reports may be mentioned Dr. Rieck, of Bassam, Upper Guinea, Africa (*Deut. Medizinal-Zeitung* for 1896, page 1075) and Dr. Wendt.

A new synthetic compound of this agent has been produced in England by combining Guaiacol with Piperidine under certain conditions, which goes by the name of Guaiacolate of Piperidine, possessing the important property of being soluble in about $3\frac{1}{2}$ per cent. of water. Drs. Arnold Chaplin and F. W. Tunnicliffe, of London, England, have reported their experience in the treatment of phthisis by this new compound with the following conclusions:

"In stating the effects of any new drug upon a given disease, the physician must always guard himself against 'over enthusiasm,' so often it happens that a new medicine has been reputed to be successful in some affection, and upon fuller trial its effects are found to be trifling, or even *nil*. Of piperidine guaiacolate it may be generally stated:

"1. That experience has shown that it is a perfectly safe drug in doses from 5 to 30 gr. (325 milligrammes to 2 grammes) three times a day.

"2. That it causes no unpleasant effects.

"3. That it is exceedingly well borne by the stomach, and in this respect it is equal to any other derivative of creosote.

"4. That patients while under its influence improved in appetite and general strength." (*Brit. Med. Journ.*, Vol. I. for 1897, page 136).

The Phosphate is another compound which has been in use lately. Dr. Gilbert recently reported on it before the Paris Biological Society at its meeting on February 27th last as follows :

“Guaiacol phosphate is a crystalline body, without color, smell or taste. It is soluble in strong alcohol, but insoluble in water, glycerin and oils ; it melts at 97° C. The proportion of guaiacol which it contains is 89.4 per cent.

“When introduced into the digestive tract of man or animals, guaiacol phosphate passes through the stomach without undergoing any modification, and is disintegrated in the intestine. It is then absorbed, and eliminated principally in the urine. It is less toxic than guaiacol.

“I have administered guaiacol phosphate in the form of cachets, in certain cases of pulmonary phthisis, the daily dose being from 40 to 60 centigrammes. Its action has appeared to me to be equal to that of guaiacol and creosote.

“Compared with other compounds of guaiacol, the phosphate possesses the advantage of having a larger proportion of this substance than the others, except the carbonate and the phosphite, in which the percentage of guaiacol is still higher.

“In addition, the phosphate and the phosphite are superior to the carbonate in that their disintegration results in setting free a phosphoric radicle, instead of indifferent carbonic acid.

“In comparison with pure guaiacol, the phosphate presents various disadvantages, on account of its high melting point and its insolubility in oil, which prevents it being applied to the skin or in the form of interstitial injections, suppositories or enemata. On the other hand, the absence of taste and smell, its insolubility in the stomach and its low degree of toxicity are positive advantages, which insure for it a place in therapeutics.” (*Med. Week*, Vol. V., page 104.)

The Phosphite also has been prepared as follows : 124 grammes (about 4 ounces) of Crystallized Guaiacol is treated with 50 grammes (about 1½ ounces) of Caustic Soda dissolved in 90 per cent. Alcohol. To the clear solution thus obtained Phosphorous Trichloride is run in through a tapped funnel until the solution is no longer alkaline to phenolphthalein. The salts then precipitated are filtered out, the alcohol distilled off and the residue taken up with Absolute Alcohol. The Phosphite of Guaiacol is found to be in the alcohol solution. This is evaporated on a water bath and the salt crystallized out. If

necessary this may be purified by recrystallization and finally dried over sulphuric acid. The resulting crystals are the neutral phosphite in the form of a white crystalline powder.

Guaiacol Carbonate has been given the short name of Duotal by the manufacturers.

Guaiacum is still an article much used in pharmacy, but little has been mentioned concerning it in relation to its direct or individual action in the treatment of any particular affection. A discussion on the subject of chronic gout before the Royal Medical and Chirurgical Society of Great Britain was liberally quoted from here last year with the hope that it might assist some observer who might be studying the vexed question of gout. With the same end in view this year but on an entirely different line it is proposed to introduce here the whole of a paper read before the Section on Practice of Medicine of the American Medical Association in Philadelphia, Pa., on June 1st last, on "Treatment of Gout" by Dr. H. C. Wood, of Philadelphia, for the reason that the writer's present humble opinion based on conclusions gradually formed after some study and thought run along in that same line. Dr. Wood says:

"I am expected to epitomize in fifteen minutes the wisdom of the ages with regard to the most frequent of all conditions, probably, of the better class of the human race. I want in the first place, however, to clearly develop before you what I myself believe, that all our scientific knowledge of gout at the present amounts to little more than a mass of trundling expectation upon which hereafter shall be built some true knowledge. And I think that in the successful treatment of gout the understanding of this is the basis. There are three great manifestations of the same thing which is universally allied to itself. We have rheumatoid arthritis as one type; we have podagra or true gout, as the second type; and we have acute articular rheumatism as a third type. Let me give you just one illustration from family history, that of my own case, which represents the family history of all the better families in this city which have endured here for generations: A great grandfather leaving his descendants the results of high drinking and living in England, a few dollars and much gout, the one disappearing, the other continuing; a second generation whose history I do not know much of; a third generation, nearly the whole of which dying of gouty degeneration of the cerebral arteries or heart; a fourth

generation, some of them developing attack after attack of acute rheumatism, half a dozen, eight, nine or ten in the life history of a single individual; one of them having true podagra; all of them plagued with the various manifestations that we know as nervous gout. There is a relation between these things, not the same thing, but they have the same basis, and this basis absolutely eludes our grasp scientifically.

“Now, when we come to treat gout, if we purge ourselves of the false idea which we think we possess, we can recognize the importance of this great principle, not to attempt to treat gout at all, but attempt to treat the individual who comes before us. Let me take simply the question of diet. You know that we inherited from Sydenham the belief that gout was made worse by red meats and that they should not be used. I have seen gouty patients in whom a single piece of ordinary red roast beef would precipitate a furious attack. I have also seen many gouty patients who would not get well until they were put upon red meat. What is the diet for gout? There is no diet for gout. It is diet for the individual. I have seen gouty patients who, if they took starch or sugars, went right down; and I have seen gouty patients who had to take starch and sugars to be built up. Therefore the first principle in the diet of gout is to adapt it to the individual before us. You judge of the case by the effects of experiment. In a large majority of cases sugars and starches have to be cut off. In spare gouty patients starches often do good; farinaceous diet may be essential. You have to order your diet according to the individual. A milk diet is one which probably suits the large majority of patients. But that which suits the individual, the stomach, the digestion, will suit the gout or kill the gout.

“When we come to the treatment of gout by exercise we find the one thing which does more good than anything else in almost every case, provided we direct the right amount of exercise. If we try to put into an ounce bottle, three gallons of exercise, we crack the bottle. Massage is a form of exercise, and it may be all that your patient can endure; fifteen feet of walking may bring on weariness or it may require some Alpine height. The same story, study your case. Begin with the slightest amount of exercise, but do not let up. Be inexorable. Keep it within the point of causing exhaustion, and each day do an ounce more if necessary. That is the whole secret of exercise in gouty patients. Begin with a small

measure and gradually increase the amount, and you will find it does more good than any drug. The bicycle is the great calisthenic of the world.

“With regard to drugs, there are a great many people who tell you that salicylates do no good. Men do not get good out of salicylates because they do not use them properly. I do not believe that salicylates cure gout or rheumatism, any more than that bromids cure epilepsy. They simply aid in keeping down the diathesis. If there be any cure, it is exercise. If you use your salicylates on a case properly, and get no response, you have something more than ordinary gout or rheumatism to deal with. There are certain cases which approach typical gout such as we rarely see in America, in which colchicum does good, much more good than salicylates. I have seen two cases of typical English gout corresponding to Sydenham’s description, and only two. We do not have it in this country. Those cases colchicum suits better than salicylates do. Sometimes, when the cases are on the border line, you will get the best results by a combination of colchicum with salicylates. If you have a strong robust man, he will stand it. Give him knockdown doses in addition to purging him and you will bring him through. But that treatment may be worse than the disease, and has to be used with caution.

“In using salicylates the profession almost universally choose the worst salt they can find, and that is the sodium salicylate. It is, perhaps, not so bad as salicylic acid, but it is much more apt to turn the stomach, and is less effective and more depressing than the other salts of salicylic acid. The two salts which are truly useful are the ammonium salt and the strontium salt. The ammonium salt acts immediately and severely ; the strontium salt acts slowly. If you have an acute case, use salicylate of strontium, or use the two combined. The strontium salt has this advantage, that it does not derange digestion anything like the other preparations, and many a time have I seen the best effects on the intestinal condition from the use of the strontium salt.

“In a large majority of cases you will find that salicylates produce depression, and perhaps a little nausea, general wretchedness, and the patient refuses them. Nine times out of ten you can overcome those effects by combining your salicylate with digitalis and strychnin in the same prescription.

“As to baths, you can not cure a diathesis by baths. It cannot

be done. But baths are useful, hot baths, steam baths, Turkish baths. Any man who values his own life, who has had a gouty grandfather, ought to take a Turkish bath once a week. You can not wash out ancestral traces in any other way. The kidney disease and the atheroma will be far less rife if we use the hot bath more than we do. The baths eliminate, give a temporary result, and are very useful when employed with the understanding that they do not cure the disease but relieve the symptoms.

“A word about the Tallman-Sheffield apparatus or dry heat, which I have had a good deal of experience with this year. For about three months I had a large clientele using it all day long. In the first place, it is absurd to suppose that this is going to cure the gouty diathesis any more than that any other application will. In the second place, it is my experience that it has very little value in the rheumatoid arthritis. In the third place, it is of very little value in chronic inflammations, even of purely gouty character, in joints. But I had my office crowded with people seeking relief, and it is empty to-day and that is the best criterion of the result. If the results claimed for the treatment were obtainable, I could soon fill this hall with patients, for they all want relief, but every missionary I sent out converted the people to the wrong faith. On the other hand, when you have deposits in the tendons and outside the joints; when you have traumatic synovitis, whether in baseball men or other persons, the results of this apparatus seem almost marvelous. I have seen a pitcher's hand drawn up and disabled for three or four years, the condition pronounced by a distinguished physician as gout, treated by the dry heat method, and after three or four treatments the hand had become pliable and the use of it came back. So, in acute strains and tendinous inflammations, this dry heat is of great value. In subacute rheumatism it is of value through its sweating and local influence. It has to be used at high temperatures. I carried it up to 330 degrees F. You can scorch the lint wrapped around the limb without scorching the limb. It has no value at all, according to my experience, in old cases of rheumatoid arthritis, and very little use in rheumatism of the joints.” (*Journ. Amer. Med. Assoc.*, Vol. XXIX., page 223).

Guaiacuin is the compounded trade name given to a new substitute for Guaiacol. It is prepared by the interaction of Guaiacol-Sulphonate and Quinine in molecular proportions, giving chemically Quinine Guaiacol-Bi-Sulphonate. It is described as being in

very fine yellowish, odorless, acid and bitter crystals, freely soluble in water, alcohol and dilute acids. Its advantages over Guaiacol are its freedom from odor and caustic properties. It is recommended as an intestinal antiseptic, as an efficient antiperiodic in malaria and as a stimulant to the gastro-intestinal glands. Cases of anæmia are reported to be especially benefited by its use. The dose varies from 130 to 650 milligrammes (2 to 10 grains) given in capsules three times a day. It is reported to be quite hygroscopic and therefore should be kept from the air and moisture. A 10 per cent. solution may be injected hypodermically with only slight pain.

Further confirmatory clinical reports are awaited.

“Harroving,” so-called, in the treatment of sciatica has been intimated and even tried in a modified way before, but the cases are so rare that it may be of service at least to some to read the following: “Dr. A. Marty in his thesis for graduation relates two cases of sciatica which had resisted every variety of medicinal treatment, but were cured by Dr. Gérard-Marchant by means of “harroving,” an operation which consists in tearing apart the fibres of the nerve with any blunt instrument.

“This treatment was employed for the first time by Dr. Dalagénère (Le Mans) in a case of femoro-gluteal sciatica (*The Medical Week*, 1896, p. 306) in which he had at first intended to excise, according to Quenu’s method, the small varicose veins presumably existing around the nerve. After exposing the nerve, no true varicose veins were found however; the trunk of the sciatic was simply crossed in all directions by small serpiginous vessels, which it would have been impossible to cut out between two ligatures. Dr. Delagénère then with a pair of hæmostatic forceps performed, all along the denuded portion of the nerve, a kind of teasing of the nerve-fibres, his object being to destroy any small veins which might exist in the interior of the nerve and thus to prevent stasis in them. His patient was cured.

“Dr. Gérard-Marchant concluded from this favorable result that harroving ought to have a curative effect even in cases of sciatica having nothing to do with varicose veins. He soon had occasion to test his theory in two cases of sciatica which fully confirmed this view.

“The first case was that of a woman of thirty-seven, suffering from sciatica on the right side, which prevented her from standing up, deprived her of sleep, and had already brought on the charac-

teristic scoliosis. There were no signs of hysteria and no indication that the neuralgia might possibly be due to varicose veins. It had resisted all applications of the methyl chloride spray, sulphurous douches and vapor baths.

“The second case was that of a man, forty-five years of age, with inveterate left sciatica which had also resisted all previous treatment. In this case also there were no varicose veins.

“The technique of the operation in both cases was as follows :

“The patient having been chloroformed, a cutaneous incision, 15 centimetres in length, was made along the line of the sciatic nerve, the lower bundles of the gluteus maximus muscle were divided, and the trunk of the nerve exposed. It was found to be of normal color and size, with no trace of varicose veins. Harrowing or teasing the nerve bundles was then performed on 2 centimetres of the nerve, with the blunt end of a grooved director. In the course of this operation, it was still further ascertained that the venules, passing along the nerve fibres, were not at all dilated. After the operation the nerve had become flat and double its normal width. The bleeding was stopped and a drainage tube introduced into the wound ; the muscle was then sutured, as well as the skin, and an iodoform and absorbent cotton dressing was placed over the whole.

“The dressing was held in place by means of a very simple broad flannel bandage, wrapped round the trunk, over a thick layer of absorbent cotton. To this bandage was then fixed, by means of two safety-pins, a piece of calico which was sufficiently long to reach down to the middle of the thigh and wide enough to go twice round the limb. The thigh was thus covered, and the calico bandage fixed with safety-pins at its lower end.

“The harrowed nerves remained painful for a few days, and in both patients the limb was numb ; then gradually sensation returned and the neuralgia was completely cured.

“To ascertain the mechanism of the cure in these cases, Dr. Marty experimented on a guinea-pig, a rabbit and a dog. He found that harrowing of the sciatic nerve results in temporary loss of sensation, but motility is preserved intact. He is furthermore of opinion that this operation may be tried with advantage in long-standing neuralgia of other nerve trunks.” (*Med. Week*, Vol. V., page 359.)

Holocaine is the name given to a new synthetic local anæsthetic offered as a substitute for Cocaine. It is closely allied to Phenacetin and is formed by the combination of molecular equiva-

lents of Phenacetin and π -Phenetidin with the separation of water, resulting chemically in fine crystals of π -Di-Eth-Oxy-Ethenyl-Amidin. It is basic in its action and insoluble in water. The hydrochloride—fine colorless, needle-like crystals—is the salt chiefly employed, for it will readily dissolve in boiling water, but when a hot saturated solution becomes cold it only contains about $2\frac{1}{2}$ per cent. of the hydrochloride. This solution has a slightly bitter taste, is perfectly neutral in reaction and keeps many months without change. Even boiling does not decompose it, but if boiled in a glass vessel the solution becomes cloudy, due to its attacking the glass. A porcelain vessel should always be used when sterilizing this solution. It is claimed, however, that as the solution itself is antiseptic it need not be boiled.

Dr. G. Gutmann, of Berlin, Germany (*Deut. Med. Wochensch.*, Vol. XXIII., page 165), has experimented quite largely with this agent not only on rabbits but in his eye clinic. He has found that from 3 to 5 drops of a 1 per cent. solution of the hydrochloride will first produce a temporary burning sensation which is followed in one minute by complete insensibility of the cornea. This lasts from 5 to 15 minutes. The conjunctiva is likewise affected similarly but not quite as deeply as the cornea. His clinical cases were confined to 30 men: 13 with foreign bodies in their eyes, 2 of keratitis, 7 eye operations including the use of the galvano-cautery and 8 on healthy eyes. In 2 cases of leucoma, tattooing was performed. The advantages over Cocaine are the rapidity in producing anaesthesia and the long duration of the effects. It has no effect on the pupil nor on the intra-ocular pressure. Its disadvantages are that it cannot be used in injections either subcutaneously or under the conjunctiva on account of its marked toxic properties. Until much more is learned concerning it, it is recommended not to use it hypodermically.

Drs. R. Heinz and C. Schlösser, of Munich, Bavaria, have also carried on a series of experiments with this agent, arriving at substantially the same conclusions (*Klin. Monatbl. für Augenheilkunde*, Vol. XXXV., page 114).

Ichthalbin (Ichthyol-Albumen) is a new substitute for Ichthyol introduced by Dr. H. Vieth to avoid the disagreeable properties of the latter. It is prepared by mixing solutions of Ichthyol and White of Egg which produces a precipitate. This is washed with alcohol and freely with water and finally dried, producing a fine

grayish-brown, odorless and practically tasteless powder which is insoluble in ordinary acids, but readily soluble in alkaline solutions and is non-toxic.

Dr. Arnold Sack, of Heidelberg, Germany, after a series of experiments was the first to recommend its use in all cases where Ichthyol is indicated. He reports on 30 successful cases. Its chemical properties make it a valuable intestinal antiseptic as it passes the gastric digestion undissolved and reaches the intestinal secretions where solution takes place. The adult dose is placed at from 1 to 2 grammes (15.4 to 30.9 grains) daily ; for children not to exceed 1 gramme (15.4 grains)—given best just before meals. It is calculated that 4 parts of Ichthalbin are equivalent to 3 parts of Ichthyol.

It has apparently given satisfactory results in anæmia, tuberculosis, rachitis, scrofula, syphilis and intestinal catarrh.

Ichthyol (Ammonium Ichthyol-Sulphonate) has been largely used and written upon during the past year. Comments here therefore will have to be chiefly confined rather to generalities than to an enumeration of all the allusions to its general beneficial results. It possesses some inherent properties which have not as yet been counteracted fully. The disagreeable eructations (usually present) after administration and its repulsive taste and smell are still drawbacks to its use. Various expedients have been adopted to avoid the last two, such as prescribing in capsules or coated pills. It has lately been suggested to make it up into pills with Liquorice Extract. It has recently been prescribed with Syrup of Ferrous Iodide but the pharmacist found great difficulty in mixing the two ingredients. Mr. John Martin, of Crieff, Scotland, has apparently solved the difficulty. The following is the formula and Mr. Martin's comments :

Ammonium Ichthyol.	7.5 grammes (about 120 grains)
Syrup Ferrous Iodide	
up to.....60	“ (“ 2 ounces)

Apparently every plan that could be thought of was tried in order to mix these two ingredients, and the only way it could be done was by adding 1 gramme (15.4 grains) of Powdered Tragacanth to the Syrup before adding the Ichthyol.

Practically all reports agree in the superior properties of Ichthyol as an antiseptic, analgesic, antiphlogistic and bactericide. Its use has been continued in the treatment of pulmonary tuberculosis with

favorable results. It has recently been quite successfully used painted over joints enlarged by rheumatism and gout. In scarlet fever, measles and diphtheria it has its advocates.

Until the past year little attention apparently had been given to its use in the treatment of nasal and laryngeal affections but recently its efficiency is being established. Dr. M. Ertler, of Vienna, Austria, had previously reported (*Wien. Med. Presse*, Vol. XXXVII., page 1009) gratifying results in ozena, by injecting a 2 to 5 per cent. aqueous solution, preferably by means of an ordinary syringe. He concluded that this agent was the best in dry pharyngitis, either accompanied with ozena or not.

Chronic purulent otitis media has responded to this agent to good effect.

Dr. I. S. Kolbassenko, of Russia, recommends the following ointment in variolar eruptions :

Ichthyol.....	1 gramme (15.4 grains)
Oil of Sweet Almonds	6 grammes (92.6 “)
Lanolin	2 “ (30.9 “)

This is applied three times daily to the eruption just as soon as it makes its appearance, and is continued until all the crusts are detached. The entire body is coated with this ointment in cases of confluent smallpox. This procedure is not considered an inconvenience even in very young children. The general condition of the patients is favorably affected by these applications. The itching is much reduced, the suppuration decreased and the period of desiccation and desquamation is shortened one-half—the temperature generally remaining below 39.5°C. (103°F.)

Dr. Walter Gripper, of Wallington, England, reports his gratifying results in applying a solution of this agent to the inflamed tissue about a vaccination point where the most rigid precautions to avoid inflammatory action had been taken. He reports : “ I have always found painting around and even over the vesicles with a 30 to 50 per cent. solution of ichthyol in water reduces pain and irritation almost at once. It will be found a most useful application, even in ordinary cases, with or without a pad of antiseptic wool or gauze. All hot and moist applications are to be strictly avoided.” (*Brit. Med. Journ.*, Vol. I. for 1897, page 443.)

The dermatologists are making good use of this agent. It has been used effectively in erysipelas, herpes zoster, acute eczema,

psoriasis and the like. In psoriasis Dr. Richter recommends the following ointment :

Ichthyol.....	3 grammes (	46.3 grains)
Salicylic Acid.....	3 “ (	46.3 “)
Pyrogallic Acid.....	3 “ (	46.3 “)
Olive Oil.....	10 “ (	154.3 “)
Lanolin	10 “ (	154.3 “)

At the meeting of the American Medical Association in Atlanta, Ga., in May, 1896, Dr. Henry A. Pulsford, of South Orange, N. J., related his “ Experience in the Treatment of Ringworm of the Scalp in the New York Skin and Cancer Hospital,” before the Section of Dermatology and Syphilography. He advocated preferably in the 75 cases treated by him the preparations of mercury, but in the discussion which followed, Dr. Wolff, of Atlanta, made the following remarks :

“ As far as treatment was concerned he had tried almost everything. The plan which he had learned in Unna’s clinic in Hamburg he had perhaps found to be the best, and this was that the head was to be shorn, then washed with soap and then the following ointment to be applied with considerable friction twice a day, and used for several weeks :

R̄ Chrysarobin	5 parts
Acid Salicylic.....	2 parts
Ichthyol	5 parts
Vaselin.....	88 parts

Then if much irritation resulted, a milder salve such as

R̄ Zinc oxidi	6 parts
Sulph. precip.....	4 parts
Lard.....	20 parts

“ This was used until the irritation was reduced. Caps were to be worn by the patients all the time, except when being treated. Dr. Wolff remarked that he had never seen such rapid cures as in Unna’s clinic, where this plan was adopted.”

Dr. M. B. Hutchins, of the same city, followed in the discussion. “ He had tried, where there was only single patches of ringworm of the scalp, a mixture of corrosive sublimate, 1 to 4 grs., with kerosene oil, one ounce, until a thick scaly condition was produced, when

the application was changed to an ointment which contained the following :

R Ichthyol.....	20 grs.	1|20
Acid salicylic	20 grs.	1|20
Zinci oxid	$\frac{5}{3}$ i	32|00

until the scales were removed. He had seen cases get well in three months under this treatment." (*Journ. Amer. Med. Assoc.*, Vol. XXVIII., page 72.)

The surgeon has not lost sight of its applicability to his line of work. Orchitis has been successfully treated. Dr. Jules Chéron who reported last year its successful use in fibrous tumors of the uterus now records invariably good results in all his cases of fissure of the anus, using this agent in conjunction with Cocaine (*Gaz. de Gynécol*, Vol. XII., page 44).

Ichthyol irrigations in gonorrhea have given good results in the practice of Dr. Paul Werner. He "gives an account of the results of this treatment in the 82 cases in which information was available. In 20 of these the disease was confined to the anterior portion of the urethra and had lasted for from a week to two months before the beginning of the treatment. Absolute cure was obtained in 19 cases with from 6 to 35 sittings (average 17). In 62 cases the posterior part of the urethra was also affected, and of these a cure was obtained in only 52, the number of sittings required being from 2 to 40 (average 19). The single unsuccessful case of anterior urethritis was one of a month's duration. Here, however, the gonococci disappeared after 28 douches, but as the catarrh continued the cure could not be said to be complete. It was, however, quickly effected by zinc sulphate injections. Of the 9 cases where cure was not obtained some left the hospital against advice before a cure could be effected, and in some epididymitis supervened which obliged the douches to be discontinued. In three of them, however, the gonococci had entirely disappeared after from 3 to 28 douches. Several cases of gonorrhoeal cystitis, some of them with pyrexia and severe tenesmus, were very successfully treated by ichthyol douches, but in some others no effect was produced and the cure was obtained by argonin. A number of cases were treated by means of douches of resorcin of the strength of 1 per cent. applied similarly to the ichthyol irrigations, but with very much less satisfactory results. As evidence of absolute cure Dr. Werner requires the following facts : (1) that after 24 hours' cessation from treatment no visible

discharge is present; (2) that the urine when poured from one vessel into another is free from threads; and (3) that no gonococci can be detected in the last gonorrhœal threads found. Strictly speaking, of course, further examination should be made later, but this is impracticable with hospital out-patients." (London *Lancet*, Vol. I. for 1897, page 1166.)

The gynecologists find it of marked value in the inflammatory diseases of the female genital organs.

Dr. M. Eberson, of Tarnow, Austria, who reported last year his success with a 50 per cent. glycerin solution in erysipelas, now calls attention to his gratifying results after applying the following solution :

Ichthyol.....	50 parts
Distilled Water	40 "
Glycerin	10 "

in trachomatous conjunctival and corneal affections (*Therap. Monatsh.*, Vol. X., page 627).

Dr. P. Luciani, of Pavia, Italy, reports his excellent results with a 1 to 10 per cent. application in the form of a wash and a 2½ to 10 per cent. ointment in blepharitis, simple conjunctivitis, catarrhal conjunctivitis, phlyctenular keratitis, hypokeratitis and scleritis (*Therap. Monatsh.*, Vol. X., page 627).

Drs. J. Darier and Sehlen recommend the following ointment in the same class of cases :

Ichthyol	0.5 grammes (7.7 grains)
Powd. Starch	10.0 " (154.3 ")
Zinc Oxide	10.0 " (154.3 ")
Vaselin	25.0 " (385.8 ")

(*Therap. Wochensch.*, Vol. IV., page 764).

Dr. G. S. Jacovidès, of Paris, France, has published (*Gaz. hebdom. de Méd et de Chirurg.*, Vol. 44, page 416) his researches on the therapeutical properties of Ichthyol in blepharitis and the different forms of conjunctivitis. He varied the strength of his applications according to circumstances, in accordance with the following formulas :

Ichthyol	5 grammes (77.2 grains)
Distilled Water	5 " (77.2 ")
Ichthyol	3 " (46.3 ")
Distilled Water	7 " (108.0 ")
Ichthyol	0.5 to 1 gramme (7.7 to 15.4 grains)
Vaselin	20.0 grammes (308.6 ")

With these he obtained results often superior to those obtained by other means but always particularly favorable.

Dr. W. Ottinger, of Exbrücke, is evidently gratified to report his success in the treatment of stings from all classes of insects by the use of Ichthyol, either alone or in a Lanolin or Vaseline ointment (equal parts). He found all the usual devices of little avail and therefore can speak with emphasis on his results with this agent. The swelling, pain, burning and itching all rapidly disappeared after applying the pure Ichthyol or the ointment. The affected part with the application upon it is covered with some impervious material like India-rubber cloth. If a limb is affected it is finally enveloped in ice. In conjunction with this external application used pretty plentifully Dr. Ottinger prescribes internal medication in the form of 10 drop doses of equal parts of Ichthyol and a mixture of Ether and Alcohol.

Iodocrol is another substitute for Iodoform little heard of in the current literature. It is an Iodide of Carvacrol. It may be well to state here that Carvacrol is an oily liquid obtained by a particular chemical manipulation of Oil of Caraway. It has the same chemical composition as Carvol (a constituent of Oil of Caraway) and Thymol, but different properties and therefore it is an isomeric form of these compounds.

Dr. Arthur H. Cohn, of Milwaukee, Wis., considered it in a paper read by him before the Section on Materia Medica, Pharmacy and Therapeutics at the Annual Meeting of the American Medical Association held in Philadelphia, Pa., on June 1st last, in which he states :

“Experiments have been made to grow staphylococci and streptococci on carvacrol iodid, but with negative results, thus proving it to be a true antiseptic. It may be used as a dusting powder, either pure or diluted with boric acid. In the treatment of the nose and throat it is best used in a solution of almond oil or olive oil. It has been used as a dressing for wounds to a great extent in Milwaukee in the National Home of Volunteer Soldiers. It is also manufactured into gauze. It may be used with great benefit in almost all surgical dressings: eczema, pruritus, chaneres, chanroids, etc.

“In conclusion, I would say that this preparation has so many advantages over iodoform, especially so of being a true antiseptic, that I sincerely recommend it to the profession and hope it will be given a fair trial.” (*Journ. Amer. Med. Assoc.*, Vol. XXIX., page 464.)

Iodoform has lost none of its prominence by reason of the competition of its numerous substitutes. It has been so successfully used and commented upon during the past year that it would be quite impracticable to repeat here even an outline of its successful applications.

To make up for the claim long contended by some well-known observers that Iodoform did not possess antiseptic properties, a well-known European firm has offered what they term "Eka-Iodoform" which is simply π -Formaldehyde added to Iodoform. Dr. Adolf Gottstein, of Berlin, Germany, has employed it and reports favorably on its use in the dressing of wounds (*Therap. Monatsh.*, Vol. XI., page 381).

This question of the antiseptic properties of Iodoform has now been reinvestigated by Dr. P. F. Lomry, of Löwen, Prussia, who apparently has succeeded in giving an explanation of the diverse results obtained by prominent observers. He apparently confined his investigations to the pyogenic streptococci and staphylococci for the reason that the real differences occurred with these two. He found that Iodoform aided the healing process both in the case of infected wounds in dogs as well as in men. The growth of these cultures was greatly diminished *in vitro* by adding Iodoform to the nutrient medium. He claims that the negative results obtained by previous investigators are due entirely to the fact that culture media were employed in which Iodoform was insoluble, whereas he found the effect is very inappreciable in all kinds of serum in which Iodoform is even slightly soluble. This explains the action in suppurating wounds. Further experimentation showed that the virulence of the micro-organisms is markedly diminished and their toxins partly neutralized by this agent, and that Iodoform actually stimulates phagocytosis. However, as Iodoform is not claimed to be bactericidal the ordinary aseptic precautions should be observed and the dressing renewed each day so that the leucocytes which have accomplished their work may not remain as nutriment to the surviving microbes (*Archiv. für klin. Chirurg.*, Vol. LIII., page 787).

Dr. E. De Renzi, of Naples, Italy, has the following formulas to offer in the treatment of pulmonary tuberculosis :

Iodoform	2	grammes (30.9 grains)
Tannin	4	" (61.7 ")
Iodoform	2	" (30.9 ")
Naphthalin	2 to 4	" (30.9 to 61.7 grains)

Dr. Th. Faure, of Chaux-de-Fonds, Switzerland, reports that the following application :

Iodoform..... 2 grammes (30.9 grains)

Collodion.....31 “ (480.0 “)

frequently applied to the eruption of smallpox usually prevents all traces of pitting.

Dr. J. Tussau, of Mâcon, France, describes a pathological state which he calls “Surgical Iodoformism.” He explains this term by reminding his readers that Iodoform contains about nine-tenths of its weight of Iodine and that the investigations heretofore made by others and the phenomena fully described by them are simply those of manifestations of acute *Iodism*, not of *Iodoformism*.

“The pathological state, on the other hand, which I describe under the name of *surgical iodoformism*, is a genuine morbid entity, the result of a special action of iodoform, its symptoms being invariably the same and pathognomonic.”

The article is instructive to those interested in the subject. From the detailed explanation he gives he says, “It is a rational assumption that Iodoform exerts an action *sui generis* on the terminations of the nerves, on the sensory corpuscles.” He closes as follows : “The practitioner should therefore be on his guard against the disagreeable surprises sometimes following the application of iodoform, and bear in mind that, if iodoformism manifests itself, the use of this substance for dressing should immediately cease, and the patient should be informed of the susceptibility which he has acquired in respect of this substance.” (*The Med. Week*, Vol. IV., page 542.)

The toxic effects of Iodoform have too abundant illustrations from all quarters, and caution is continually advised. Dr. Jas. W. Russell, of Birmingham, England, has recently published his “Notes on Two Cases of Toxic Amblyopia from Iodoform.” He concludes as follows : “Since the cases above referred to, together with the two recorded in this paper, appear to establish the fact that iodoform is liable to cause amblyopia, it becomes a question whether its use internally is any longer justifiable. This question may, I think, be answered in the affirmative, always supposing that the treatment is of real value. In my own cases and in that recorded by Hirschberg, recovery was complete and rapid after the discontinuance of the iodoform ; in the other two recovery was progressing satisfactorily when the last notes were taken. It therefore

seems probable that if the amblyopia be early recognized and the drug promptly omitted no permanent mischief need be feared. I have now adopted the plan of recording the vision of all those patients whom I am about to treat with iodoform before beginning its administration; I then make periodical inquiries as to the sight, and am able to discover when any diminution is acknowledged, whether alteration has really taken place. This measure is, I find, absolutely necessary owing to the certainty in hospital out-patient practice that any symptom frequently inquired for will sooner or later be acknowledged by the patient. I have only to add that in my cases the onset of the amblyopia was not accompanied by any other symptom." (London *Lancet*, Vol. I. for 1897, page 1608).

Iodoformin, the substitute for Iodoform alluded to here last year, has not been heard of in the current medical literature of the past year.

Iodol (Tetra-Iodo-Pyrrol)—the Iodoform substitute—has not been at all prominent in the current medical literature of the year. Apparently Dr. Domenico Majocchi, of Bologna, Italy, still believes in its efficacy. He now reports his favorable results with it in the form of a plaster in the treatment of various syphilitic diseases. According to his observations the maceration, inflammation and peeling of the skin noticed when using Resorcin and mercurial plasters did not occur when using this plaster. No displacement of the plaster was noticed even after six or eight days of application. Neither did any irritation occur (*Monatsh. für prakt. Dermat.*, Vol. XXIV., pages 460 and 496).

A combination with Caffein is now offered as another substitute for Iodoform and called "Caffein-Iodol." It is prepared by bringing together Caffein and Iodol in equivalent weights in alcoholic solution. It is described as a grayish, odorless and tasteless powder, very sparingly soluble in the usual solvents.

Its external use is to replace Iodoform in all its applications. Internally it is claimed to be an efficient substitute for Potassium Iodide.

Iodo-Thyrin is the transposed name given to the previously known preparation Thyro-Iodin and commented upon here last year. This change was made largely for commercial reasons as some confusion with other preparations had occurred. The manufacturers add Powdered Milk Sugar to the active principle of the Thyroid Gland in such proportion that one part of this preparation is equivalent to one part of the fresh gland.

In direct connection with these similar preparations Dr. Catillon, of France, has recently described to the Société de Thérapie a method of preparing the active part of the Thyroid in the form of a standardised preparation. He prepares it as follows: The glands are digested with Pancreatin and water in order to put it through this part of the digestive process. What remains as a residue is extracted with petroleum ether, then dissolved in diluted soda solution and filtered. After slightly acidulating the filtrate with dilute sulphuric acid, a precipitate is found as the active principle. After washing this precipitate the amount of Iodine is determined and the requisite amount of Milk Sugar added to adjust its strength in order to make the amount of Iodine present equal to 0.0003 grammes ($\frac{1}{3000}$ of a grain) in each 1 gramme (15.4 grains) of the finished preparation.

Naturally the various uses of this preparation are those of Thyroid Extract, but individual reports are being made specially under this head.

Itrol (Silver Citrate), introduced by Dr. B. Credé, of Dresden, Germany, along with Actol (Silver Lactate) and alluded to here last year has not been heard of in the current medical literature of the past year except as far as given by Dr. O. Werler, of Berlin, Germany, in the *Derm. Zeitschrift*, Vol. III., page 582.

Izal, the patented antiseptic alluded to here last year, has been practically unheard of during the past year.

Kreosolid is a new Creosote preparation introduced by Dr. Denzel of Tübingen, Württemberg, Germany. It is claimed to be a Magnesium compound of the phenols in Creosote (Kreosote). It is described as a colorless powder with only a slight odor and taste and no caustic action. The dose is 500 milligrammes (7.7 grains) given four times a day. Decomposition results in the stomach yielding its constituent parts, thus offering an agreeable form of administering either Creosote or Guaiacol whose ultimate function is to produce like beneficial results. It is found that 1 gramme (15.4 grains) is about equivalent in results to 2 grammes (30.9 grains) of Creosote. Nothing is known of this agent in this country as yet.

Kryofin is the name adopted for a new antipyretic—closely allied to Phenacetin—discovered by Dr. Bischler, of Zurich, Switzerland, and introduced by a well-known manufacturing firm in Basle, Switzerland. It is a condensation product resulting from

heating together up to 120° to 130°C. (248° to 266°F.) π -Phenetidin and Methyl-Glycolic Acid. It is presented in colorless, odorless and almost tasteless needle-like crystals, only soluble in cold water to the extent of 1 in 600, but in boiling water of 1 in 52 parts. If such solutions are concentrated the taste becomes decidedly bitter.

Dr. Hermann Eichhorst, of Zurich, Switzerland, strongly recommends it as a very serviceable antipyretic and antineuralgic—even more certain and with far less after-effects than either Antipyrin or Phenacetin. The dose is 500 milligrammes (7.7 grains) to 1 gramme (15.4 grains)—about one-half that of Phenacetin. It has been tried successfully in typhoid fever, pleuro-pneumonia, puerperal septicæmia, tubercular meningitis, post-scarlatinal febrile nephritis, facial erysipelas, the febrile condition of phthisis and other febrile conditions. Dr. Eichhorst found it less valuable than other well-known agents in acute or chronic articular rheumatism. He, however, observed that if it absolutely failed the other agents like Phenacetin, Lactophenin, Antipyrin, Sodium Salicylate and Exalgin also almost always failed. In doses of 500 milligrammes (7.7 grains) three times a day Dr. Eichhorst was able to alleviate the painful symptoms of sciatic neuralgia and alcoholic polyneuritis. Excessive diaphoresis and cyanosis were sometimes produced in febrile cases (*Deut. Med. Wochensch.*, Vol. 23, page 257).

Nothing is known of this agent in this country as yet.

Lactophenin (π -Lactyl-Phenetidin)—closely related to Phenacetin—is still claimed by many observers to be superior to the other well-known antipyretics. Some even go so far as to urge its greater safety than Antipyrin and Phenacetin. Its consideration is surely being kept prominently before the medical profession by the enterprising agents who represent its interests.

Loretin (Meta-Iod-Ortho-Oxy-Chinolin-Ana-Sulphonic Acid)—the Iodoform substitute—has received little attention of any permanent value during the past year. Dr. J. Abbott Cantrell, of Philadelphia, Pa., has published his experiences with it in cutaneous affections (*The Phila. Poly.*, Vol. VI., page 293) in which he concludes:

“On the whole, therefore, I conclude that loretin has an extremely limited field of usefulness as an external application in diseases of the skin.”

Loretin being acid in its reaction will form salts, and some of

these have been suggested and formed—such as the salts of Calcium, Strontium, Barium and Magnesium, but no definite clinical results with these have yet been reported.

Luteol—the trivial name applied to Oxy-Chlor-Di-Phenyl-Quin-Oxalin, a new indicator possessing certain advantages over Phenol-thalein and Litmus—has not been mentioned except in the way of repetitions during the past year.

Lycetol (Di-Methyl-Piperazin Tartrate)—the uric acid solvent—has received somewhat more attention during the past year both in the old and in this country. Dr. R. de Jollenaere, of Belgium, reports his gratifying results in two cases of chronic gout under treatment for many years previous with quite all the recognized agents to be suggested in such cases—all giving discouraging results. This agent was tried during several attacks and gave temporary relief in both cases. In one, however, the patient requested it to be discontinued as it was not giving permanent relief. The other case was free from suffering six months after treatment, but was still taking 32 milligrammes (about $\frac{1}{2}$ of a grain) each day. The temporary relief in both cases, it is claimed, was so satisfactory as to make the agent of enough value to try in all subsequent cases. Dr. de Jollenaere also treated 7 cases of chronic articular rheumatism with this agent, of which 4 were classed as satisfactory. In 2 cases of acute articular rheumatism, the results were doubtful. In 4 cases of sciatica, 2 were favorable and 2 negative. Dr. de Jollenaere concludes that although this agent may not be properly classed as a specific (?) in gout and chronic rheumatism, still it is very valuable even as giving at least temporary or a limited amount of relief. The daily dose was from 100 to 130 milligrammes ($1\frac{1}{2}$ to 2 grains)—in divided doses.

Dr. P. Hamonic has continued to use this agent for some time back and now makes a report of his experience in the treatment of affections of the urinary passages and organs. He verifies the statement that it has seven times the solvent property over uric acid and the urates that Lithium has, and acts as a most energetic diuretic. He reports on 6 cases of urinary lithiasis, including one particularly severe case where actual nephrotomy was being considered. He finds also that it rarely fails to relieve greatly the excruciating suffering of renal colic in a short period of time. He reports on 16 cases of purulent cystitis. Other affections are also in his list of more or less successful results. Very lately he has had

comparatively favorable results in the treatment of diabetes. No injurious affects are reported from its use wherever used.

Dr. Wettzack recommends the following formula in renal colic (*Gaz. hebdom. de Méd. et de Chirurg.*, Vol. 44, formulas following page 660):

Lycetol.....	1.5 grammes (23.5 grains)
Sodium Bicarb.....	0.5 “ (7.7 “)

This dose is given twice daily in a glass of some mineral water.

Malarin, the new patented compound alluded to here last year as of service in the treatment of neuralgic headache and toothache, has not been heard of during the past year aside from its mention by the manufacturers.

Mallein, the tetanus antitoxin analogous to Tuberculin, although undoubtedly still prominently before the profession has not been commented on during the past year.

Menthol still finds new lines for its application. Dr. A. Morel-Lavallée, of France, recommends the following mixture to control the vomiting of seasickness:

Menthol.....	0.10 grammes (1.5 grains)
Cocaine Hydrochlorate..	0.20 “ (3 “)
Alcohol	60.00 “ (about 2 ounces)
Simple Syrup.....	30.00 “ (“ 1 ounce)

5 grammes (1 teaspoonful) is to be given every half hour (*Le Bulletin Médical*, Vol. 10, page 1199).

Dr. Herbert B. Whitney in an article on “Some Hints as to the Treatment of ‘Colds,’ ” states (*Medical News*, Vol. LXX., page 100): “During the first two or three days of a coryza the most useful of all the preparations I have employed is a snuff, the principal ingredients of which are cocain and menthol:

R Cocain hydrochlor	gr. iiss
Menthol	gr. iv
Acidi borici	3 ss
Pulv. coffeae....	gr. viii
M. Sig. Snuff (Coupard).	

Of this, a small pinch is directed to be taken in each nostril every two or three hours. It gives great temporary relief, and I am frequently asked to have the prescription repeated. This snuff may also be used with benefit after there is an abundant catarrhal

secretion. It may, with advantage, be combined with the internal use of gelsemium, or, later, with atropin."

Drs. C. Bozzolo and E. Mangianti, of Italy, treated the pruritus of jaundice with the following solution applied to the itching parts in the form of a spray :

Menthol	2 grammes (30.9 grains)
Alcohol	20 " (308.6 ")
Ether	20 " (308.6 ")

Dr. Gaucher, of France, recommends the following in the form of a spray to the itching parts in urticaria (*Gaz. hebdom. de Méd. et de Chirurg.*, Vol. 44, formulas opposite page 660) :

Menthol	10 grammes (154.3 grains)
Chloroform	30 " (463.0 ")
Ether	30 " (463.0 ")
Spirit of Camphor	30 " (463.0 ")

This may be used either by spray or as a lotion.

The following ointment is strongly recommended by Dr. Strangways for instant relief in hay fever :

Menthol	1.30 grammes (about 20 grains)
Oil of Sweet Almond ..	8.00 " (" 123.5 ")
Carbolic Acid	0.62 Ce. (" 10 minims)
Cocaine Hydrochlorate.	0.40 grammes (" 6.5 grains)
Zinc Oxide Ointment ..	15.50 " (" 4 drachms)

Dr. Namé prescribes the following formula for promptly relieving the pain in all forms of contusions except bruised joints :

Menthol	from 3 to 6 parts
Collodion	24 " 27 "

The following composition is recommended for pertussis :

Formaldehyde	2 parts
Menthol	40 "
Methyl Alcohol	58 "

and is offered as a specialty under the trade name of "Holzinol."

In the new edition (fifth) of the Russian Pharmacopœia about to be issued this agent is among the additions to be officially recognized.

Methæthyl (Methyl-Ethyl) is a new local anæsthetic introduced by Dr. G. F. Henning, of Berlin, Germany, and claimed to have advantages over Ethyl Chloride. It is described as a clear,

colorless, neutral liquid with an odor which reminds one of Chloroform. It has a burning and bitter taste, is soluble in all proportions of alcohol, ether and chloroform. Its flame when burning is green on the edges and leaves no residue. It consists for the most part of Ethyl Chloride and small quantities of Methyl Chloride and Chloroform. Its boiling point was found to be 10.5°C . (51°F .) The specific gravity is 0.9173 at 4°C . (39.2°F .)

Little information has yet been given aside from the above.

Methylene Blue (Tetra-Methyl-Thionine Chloride)—the anilin derivative—has received considerably more attention during the past year than the year previous, but reports are still conflicting as to its successful use in almost every affection in which it has been used. Toxic symptoms continue to be produced, therefore caution is urged, for the susceptibilities of patients differ so largely that the initial doses should be the minimum, even though the important point of purity of the agent has been previously settled in the affirmative. It has seemed to be necessary to call attention again to the distinction between Methyl Blue and this agent. The former belongs to the rosanilin group and chemically is Sodium Tri-Phenyl-Rosanilin-Tri-Sulphonate, and differs in its chemical reactions.

Little has been reported of late on the use of Methylene Blue in the treatment of carcinomatous growths.

Dr. Du Castel has continued systematically Dr. J. Darier's recommended treatment of epithelioma of the face for some two years and now records a large number of cases. He made a report at a meeting of the Paris Therapeutical Society on November 11th last. He applies a solution of

Methylene Blue	1 gramme	(15.4 grains)
Absolute Alcohol	2.5 grammes	(39.0 ")
Glycerin	2.5 " "	(39.0 ")

about every third day, then a 20% Chromic Acid solution and again the above solution. His successful results surprised him, although recovery did not always take place and recurrences were evident at times. He claims certain precautions are necessary to obtain the best results. (*The Medical Week*, Vol. IV., page 560). In the discussion which followed Dr. H. Hallopeau, of Paris, France, reported that he was by no means satisfied with his own results in using it. Dr. C. Mazet, of Marseilles, France, reports equally good results by the same Darier method in the same affections.

Dr. Dubarry, of France, reports in detail a case of epithelioma of the face treated by interstitial injections of an average of 1 gramme (15.4 grains) of a 10 per cent. solution in distilled water without having much hope of success. In five months' time, however, the injections were stopped and the condition was most favorable, giving every evidence of it proving to be a permanent cure. If relapses occur he proposes to simply repeat the same treatment.

The results in the treatment of malaria still continue to be conflicting. Dr. Cardamatis, of Athens, Greece, has published a monograph on this treatment which Dr. Laveran criticised at a meeting of the Paris Academy of Medicine held on April 13th last.

Dr. Benno Lewy, of Berlin, Germany, reports (*Berlin. klin. Woch.* Vol. 33, page 996) his remarkable success in the treatment of migraine in cases which had previously defied all treatment. To counteract the irritation of the bladder which is apt to occur, he combines it with nutmeg as follows:

Methylene Blue..... 0.1 gramme (1.5 grains)

Powd. Nutmeg0.1 “ (1.5 “)

This dose is prescribed in a capsule given 3 or 4 times a day. A decided blue coloration in the urine is produced in half an hour and continues for some days over a week. Dr. Lewy classed this agent not as a palliative one but as a specific.

Dr. Nefédieff, of St. Petersburg, Russia, recently reported to a local medical society his unfavorable results in 4 cases of recurrent typhus fever (*Gaz. hebdom. de Méd. et de Chirurg.*, Vol. 44, page 743).

Dr. G. Lemoine, of Lille, France, reported his experiments with this agent, in the treatment of pain in ataxia, at the meeting of the Société de Biologie on June 12th last. His cases were 9. In 2 there was no improvement, in the remaining 7 there was marked decrease in the intensity and frequency of the pain (*Gaz. hebdom. de Méd. et de Chirurg.*, Vol. 44, page 570).

Dr. J. R. Philpots, of Parkstone, England, reports his experience in the treatment of rheumatoid arthritis as follows:

“In looking through the recent works on rheumatoid arthritis I find no mention of the use of methylene blue in the treatment of this disease. In several very obstinate cases which have lately been under my care, I have administered this drug with the greatest benefit, each case showing marked improvement soon after commencement of treatment. Not only does the arthritic process

appear to be altogether arrested, but the drug has a favorable influence on the general condition, improving nutrition and leading to increase of body weight. A 2 gr. tabloid is the most convenient form of administration, one to be taken twice daily after food. The patient should be warned that one of the first effects of the drug is to color the urine blue.

“Pyoktanin (methylene violet), on the other hand, has very little effect on the urine, is not well borne, and has not given good results in rheumatoid arthritis.

“Although my experience has been limited, I venture to think that the success has been sufficient to warrant my drawing attention to this treatment, and I hope that others with more opportunities will give the method a trial” (*Brit. Med. Journ.*, Vol. I. for 1897, page 781).

Dr. William Armstrong, of Buxton, England, confirms Dr. Philpots' results as follows: “I have read with much interest Dr. J. R. Philpots' note in the *British Medical Journal* of March 27th, as I have for some time past been giving a trial to methylene blue in rheumatoid arthritis. I prescribed it mainly in those cases in which I saw reason to suspect that toxins formed in the intestinal canal were setting up—and keeping up—irritation in the joint centers of the spinal cord. My reason for doing so was that I believed it to be a powerful oxygen carrier and a destroyer of bacilli. Cases of this class treated by methylene blue, in conjunction with the Buxton thermal and galvanic baths, improved more rapidly and were less liable to relapse than those treated by the baths alone; but cases which seemed to depend upon utero-ovarian irritation, and those following influenza and other disturbances of the nervous system, did not seem to derive any increased benefit from the addition of this drug to the method of treatment employed. This seems to me to be one more proof that success in the treatment of rheumatoid arthritis depends almost entirely upon a careful search for the initial cause of the disturbance, and modification of the treatment accordingly.” (*Brit. Med. Journ.*, Vol. I. for 1897, page 1064).

Dr. Paul Marie, of France, has reported at two meetings of the Paris Medical Society of the Hospitals held on May 7th and 28th last his good results obtained after administering this agent to a diabetic patient. He, however, admits the impossibility of determining exactly the part played by it in causing the sugar to disappear.

Drs. Marie and Le Goff offer a clinical method of determining the quantity of sugar in the blood by using a definite solution of this agent. This also was reported at the meeting of the above Society on May 7th last.

Dr. G. Lemoine, of Lille, France, reported at a meeting of the Paris Biological Society, held on May 1st last, that this agent appears to have a very remarkable effect on albuminuria of a particular type. In 3 out of 7 of his cases of acute or chronic parenchymatous nephritis the albuminuria completely disappeared in a few days.

Dr. L. Jays recommends the following form of pill in the treatment of chronic cystitis :

Methylene Blue 1.6 grammes (about 24 grains)

Powd. French Chalk . 2.4 “ (“ 37 “)

Lanolin a sufficient quantity.

These are to be made up into 20 pills, and 2 to 4 are to be taken each day.

Dr. James Moore, of Belfast, Ireland, reports in detail (*Brit. Med. Jour.*, Vol. I. for 1897, page 140) 2 cases of first attack of gonorrhea in which he had gratifying results with this agent. He ventures an explanation of its action which he admits all may not accept, but concludes that his results show “that the acute stage is cut short before the mucosa and submucosa are extensively damaged, and thus the risks of serious complications and sequelæ are lessened.

“If experience shows that this drug in any way diminishes the rapidity of development and virulence of micrococci in the tissues, it ought to prove a valuable adjunct to the treatment of general septic diseases.”

Drs. Charles Achard and J. Castaigne, of France, have continued their investigations on the permeability of the kidneys, and now report on the use of Methylene Blue as a diagnostic agent in that connection. They found its excretion by the kidneys varied as the kidney was normal or pathological, and the degree of rapidity and change showed the extent of the kidney's functional activity (*Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris*, Vol. 14, page 637).

Methyl Salicylate (Synthetical Oil of Wintergreen) has quite taken the place therapeutically of the natural Oil, as was to be expected after the very natural prejudices were overcome by actual and comparative trials. The internal use of both the natural and the artificial product has met with much success in the

treatment of both acute and subacute articular rheumatism. Dr. Gilbert Lassere, of Bordeaux, France, reports on a four years' experience with a total of 40 cases. He prescribes the following formula :

Methyl Salicylate C. P.	1 Cc.	(16.2 minims)
Brandy	10 grammes	(154.3 grains)
Simple Syrup	100 “	(about 3 ounces)
Distilled Water	100 “	(“ 3 “)

in 5 gramme (teaspoonful) doses within 48 hours. He also obtained good results in two characteristic cases of gout, but acknowledges that further and more extended trials are necessary before making any assertions.

Much attention has recently been given to the external application of this agent.

Drs. Lannois and M. G. Linossier, of Lyons, France, having fully established by experiment that this agent is readily absorbed by the skin, at once turned their attention to applying it to painful joints on compresses and well covered with India-rubber cloth to protect it from evaporation (*La Semaine Médicale*, Vol. 16, pages 125 and 338).

Dr. G. Lemoine, of Lille, France, and other observers have verified these results. A paper entitled “The Local Application of Salicylate of Methyl in Rheumatism,” was read by Dr. Armand Siredey, of the St. Anthony Hospital, at the meeting of the Medical Society of the Hospitals of Paris on May 7th last. Drs. Lemoine and Linossier discussed it (*Bull. et Mém. de la Société Méd. des Hôp. de Paris*, Vol. 14, page 688).

A more extended trial by still others is strongly urged.

Dr. Chambard-Hénon, of Lyons, France, relates the case of a woman who was rapidly relieved of an attack of herpes zoster on the nape of her neck and upper part of left side of her chest by rubbing this agent well into the healthy skin around the eruption. 5 Cc. (about 80 minims) were used in each of 5 applications and a cure (?) was recorded in 10 days (*Journ. de Méd. de Paris*, Vol. 17, page 378).

Dr. Duquaire, of France, reports successful results in the treatment of gonorrhea by injecting the following solution :

Methyl Salicylate	1 gramme	(15.4 grains)
Bismuth Subnitrate	20 grammes	(308.6 “)
Liquid Vaseline	100 “	(about 3 ounces)

These injections are called for each day after micturition, and retained in the urethra as long as possible.

Migranin (Double Citrate of Antipyrin and Caffein) apparently is still used for the treatment of sick headache and neuralgia, but little notice has been taken of it in the current medical literature of the past year.

Naphtalin (Naphthalene)—one of the hydrocarbons obtained from coal-tar—has not only continued to be employed as an efficient intestinal antiseptic, but favorable reports come from at least two observers who have obtained favorable results in treating pertussis. Mr. Philip J. Brayn, of the Isle of Jersey—an Admiralty Surgeon—reports (*Brit. Med. Journ.*, Vol. I. for 1897, page 1477) :

“It occurred to me two years ago to try naphthalene in the treatment of whooping cough. I confess not having observed much improvement in some cases when I applied that drug ; but that was owing partially to inability to thoroughly study and observe the cases under treatment. During the last epidemic I determined to go into the treatment very carefully, and the results have been most satisfactory.

“I treated 12 cases in children in whose mothers I could in every way place confidence with regard to veracity, and whose intelligence and common sense were above the average. The ages ranged from 3 to 8 years. The usual routine of treatment was tincture of belladonna and potassium bromide in varying doses and naphthalene fumes inhaled continuously day and night.

“A simple method of procedure was to instruct the child’s mother to make a small muslin or linen bag containing the drug, and to suspend it around the child’s neck. At other times I ordered the drug to be well rubbed into the child’s clothes. The floor of the sick chamber was also sprinkled with it.

“From careful inquiries made, and visits paid at irregular intervals, I am quite sure that the frequency of the paroxysms was very much diminished, and the patients made more comfortable in every way.

“I selected the above cases, among a great many I had under treatment, not with regard to the malady, but in reference to the integrity and truthfulness of the patients’ friends.

“So far as the prophylactic influence of the drug is concerned, I may note that in some families infected with whooping-cough, one or two members in each escaped infection. At present, however, I do not wish to attribute too much to the usefulness of the drug in that direction.”

Dr. Claude A. P. Truman, of Reading, England, adds his testimony to the above as follows (*Brit. Med. Journ.*, Vol. II. for 1897, page 64) :

“I was interested in reading your correspondent’s note upon the above subject. I have used this treatment for five or six years with almost unvarying success, and I now adopt it as a routine practice. In cases where it has failed I have often used the biniodide of mercury (internally), but with varying results. I have found naphthalin, when administered internally, to have extraordinarily good influence in gastro-enteritis in young children; and in many of their diseases, caused no doubt by the products of digestion, or rather indigestion, it will be found to ‘act like a charm.’”

Naphtol (β -Naphtol) is still extolled as a most efficient intestinal antiseptic. Dr. J. de Maximovitch, however, makes use of the α -Naphtol for that purpose in the following formula :

α -Naphtol.....	3 grammes (46.3 grains)
Chloroform	15 drops
Castor Oil	100 grammes (about 3 ounces)
Oil of Peppermint.....	5 drops

The dose is 15 grammes (1 tablespoonful) in port wine, beer or black coffee with sugar. For children 5 grammes (1 teaspoonful) is recommended.

Injections of Camphorated Naphtol have been used as a palliative in the treatment of sarcoma and as a curative in tubercular peritonitis.

Nosophen (Tetra-Iodo-Phenol-Phthalein)—the Iodoform substitute—undoubtedly has received more attention during the past year than in the previous one. Evidently those surgeons who have continued to use it and its Bismuth salt (Eudoxin) still cling to them as being superior to Iodoform, but for the benefit of the whole profession, it would be of value if those who still retain Iodoform would frankly state in print why they have abandoned these comparatively new agents after trial. Can it be that they have not given a fair trial in point of time allowed to the number of cases treated, or are there objections or disadvantages which are yet unreported?

Nutrose (a neutral compound of Casein with an alkali) alluded to here last year as a new German food preparation, has received practically no attention in the current medical literature during the past year.

Orexin (Phenyl-Di-Hydro-Quin-Azoline)—the appetite promoter and stomachic—is still in use by those who continue to believe good results are being obtained. Some claim that it excels all the other stomachics generally used. The Hydrochlorate of Orexin has been practically abandoned on account of its tendency to produce vomiting in some cases, and also a burning sensation in the stomach. Also its taste and odor are against it. The base Orexin itself is to be preferred as none of the above objections are yet recorded against it.

From what has been written during the past year, there appears to be no good reason for altering the conclusions drawn here last year. To aid those interested in drawing their own conclusions, however, the following references are given: Prof. Dennaro Seognamiglio, of Naples, Italy, reports (*Wien. Med. Blätter*, Vol. XX., page 417) on an extensive use of Orexin—70 cases with striking results as a stomachic without any unfavorable symptoms. His further trials in the vomiting of pregnancy are described as quite marvelous, even to the saving of life.

Dr. Rech, of Cologne, Germany, witnessed a case of such marked relief in the vomiting of pregnancy that he thought it well worth while publishing, although he admits that one favorable case does not necessarily determine the true value of an agent (*Centralbl. für Gyn.*, Vol. 20, page 851).

Orphol (β -Naphtol Bismuth)—recommended like β -Naphtol itself as an intestinal antiseptic—has had few direct allusions to itself during the past year, but as its applications are those of β -Naphtol itself and with better effect, many observers no doubt have made use of it without mentioning their results in connection with this Bismuth salt. It is more easily administered than β -Naphtol, especially to children, and does not produce the burning sensation noticed when using the latter. It appears to be especially useful in summer diarrhea and diarrhea attending typhoid fever and pulmonary tuberculosis. Dr. Gölner, of Erfurt, Prussia, reports on the latter application (*Allgemeine Med. Central-Zeitung*, Vol. 65, page 1154).

It may be of service to repeat here that the composition of Orphol claims to be 26.5 per cent. of Naphtol and 73.5 per cent. of Bismuth Oxide, and that it is to the antiseptic action of the first element and the astringent action of the second that its beneficial results are obtained when it splits up in the intestinal tract.

Orthoform is a new synthetic local anæsthetic constituted like Cocaine and introduced by Drs. A. Einhorn and R. Heinz, of Munich, Bavaria. The reasoning and deductions made by these investigators in building up this synthetic compound on the same plan that Cocaine is formed upon will be instructive to those who are interested in the strictly chemical side of such questions, but would be hardly in place here, however it will suffice to mention that chemically it is the Methyl Ester of π -Amido-*m*-Oxy-Benzonic Acid. It is described as a light, bulky, colorless, odorless and tasteless stable crystalline powder, not hygroscopic, sparingly and slowly soluble in water—sufficient is dissolved, however, to make it a serviceable *fluid anæsthetic* and it is thus employed. It appears to be absolutely free from toxic effects and yet has marked antiseptic properties and thus well adapted to use in the treatment of open wounds: “When applied on the mucous membranes in the form of a powder or of an ointment, orthoform gives rise in a few minutes to slowly progressive anæsthesia. Anyone may easily convince himself of this by spreading a uniform layer of the drug onto the tongue or the ocular conjunctiva. The same analgesic action also manifests itself on the raw surface of wounds and of painful ulcerations, but not through the skin or a thickened and indurated mucous membrane. Orthoform remains inactive, therefore, whenever there is no solution of continuity of the integument, as in burns of the first degree for instance, in wounds closed by sutures, etc.

“Its analgesic action is extremely marked, on the other hand, in burns of the third degree, in all painful wounds (cancers, varicose ulcers of the leg), fissures of the lips, nipple and anus, excoriations, ulcers of the tongue, larynx, etc.

“Taken internally, orthoform is an efficacious remedy for soothing the pain of round ulcer and cancer of the stomach, but it fails to relieve the painful sensations connected with chronic catarrh or with dilatation of the stomach, the gastric mucous membrane being intact in these cases.

“Orthoform combines with hydrochloric acid, forming with it a soluble salt. This orthoform hydrochlorate is not suitable however for anæsthetising the conjunctiva, or the nasal, buccal or pharyngolaryngeal mucous membranes; nor can it be utilized for subcutaneous injections, as it is very irritating to the tissues, owing to the acid reaction of its solutions. It may nevertheless be used internally in ulcers and cancers of the stomach, and also for urethral injec-

tions in cases of gonorrhea. A patient who suffered from chronic gonorrhea bore without any reaction an injection of a 10 per cent. solution of orthoform hydrochlorate, and the urethral anæsthesia thus obtained persisted for twelve hours. In a case of recent gonorrhea, these injections gave rise to marked reaction every time they were tried; four days later however the discharge had entirely ceased.

“Orthoform being devoid of all toxic action as shown by experiments on animals, it may be freely used on wounds and on mucous membranes. In a case of cancer of the face for example, 50 grammes of the powder were used locally in the course of a single week without any ill-effect whatsoever; indeed the patient experienced considerable relief from its use.

“Prof. Einhorn and Dr. Heinz assert that doses of from 50 centigrammes to 1 gramme of orthoform, or of orthoform hydrochlorate, may be given internally, and even repeated several times a day without ill-effects.” (*Med. Week*, Vol. V., page 444).

Paraldehyde (officinal) is now largely and successfully used. Occasional bad results are reported, especially when prolonged use has been made of it. Dr. G. Reingold, of Barmen, Prussia, relates a case of delirium tremens attributed to its use, presented at a clinic in Freiburg and may be of interest to those who desire to refer to it (*Therap. Monatsh.*, Vol. XI., page 300).

Pellotin, the new hypnotic recently brought to the notice of the medical profession by Dr. F. Jolly, of Berlin, Prussia, has been investigated still further. Dr. Langstein, of Teplitz, Hungary, has recently observed a case of locomotor ataxia in which 10 milligrammes ($\frac{3}{8}$ of a grain) of Pellotin Hydrochlorate (which will be noticed is a smaller dose than Dr. Jolly employed) was subcutaneously injected. This brought on a dangerous condition of collapse from which the patient rallied only after the energetic application of stimulants continued for half an hour. The patient's heart was perfectly normal and he had usually borne other agents very well even in very large doses. Dr. Langstein desires to call attention to the fact that this simply goes to show that such agents must be handled with great care (*Prager Med. Wochensch.*, Vol. XXI., page 446).

Dr. Alexander Pilez, of Vienna, Austria, has investigated this agent and published his results (*Wien. klin. Wochensch.*, Vol. IX., page 1121). He has tried it in 58 cases of insomnia, giving about 20 milligrammes ($\frac{5}{8}$ grain) as the minimum dose. The patients were those of the principal lunatic asylums in Vienna. Perfect

results were obtained in 29 cases—all the patients falling asleep within an hour and a half and continuing asleep all night. A moderate effect resulted in 17 cases, and in the remaining 12 this agent was quite ineffectual, though of these latter Dr. Pilez considers that 4 should be excluded from the test. Of the successful cases 19 responded to the minimum dose. Dr. Pilez was not able to observe the slowing of the pulse recorded by Dr. Jolly nor the collapse seen in one of the cases of Dr. Langstein. He was not looking for any anodyne effects. Giddiness was present only in 2 cases—one of these was a paranoiac with sensory hallucinations. Dr. Pilez thought this agent of value in very many cases where others failed, and particularly valuable in being suitable for subcutaneous injection.

Pental (Tri-Methyl-Ethylene)—the anæsthetic for minor operations—has not been commented on during the past year, and it may be that the timely warning given by some observers has been heeded.

Peronin is the name given to a new chemical salt originating in Germany and proposed as a substitute for Morphine. It is described as Hydrochlorate of the Benzylie Ether of Morphine, in the form of a bulky white, bitter powder composed of very small prismatic crystals. It is readily soluble in water, difficultly soluble in ordinary alcohol and insoluble in Chloroform and Ether.

Dr. Schröder, of Hohenhonnef-on-the-Rhine, Prussia, has published his experiments (*Therap. Monatsh.*, Vol. XI., page 4) as to the physiological effects of this salt, and states that they are intermediate between Morphine and Codeine, exerting a very quieting action on the paroxysmal cough in pulmonary tuberculosis—it does not cure the cough, but simply gives relief. He reports on 12 cases in which he administered doses from 20 to 40 milligrammes ($\frac{5}{16}$ to $\frac{5}{8}$ of a grain) either in solution or pills just before going to bed each night. It is claimed to be better borne by the patient than Morphine, and by inducing sleep is to be preferred to Codeine.

Recently Dr. Siegmund Nowak, of Cracow, Austria, has reported (*Therap. Wochensch.*, Vol. IV., page 519) the results of his studies of this salt in 18 cases—10 of pulmonary tuberculosis, 4 of chronic bronchitis and pulmonary emphysema, 3 of acute bronchitis and 1 of capillary bronchitis.

Dr. Jakob Munk also gives the results of his recent investigations. He found that doses of 20 milligrammes ($\frac{5}{16}$ of a grain) given 3 times a day caused no unfavorable effects in the way of indisposi-

tion or drowsiness, but acted as an analgesic and checked the cough. When the doses were increased up to 40 milligrammes ($\frac{5}{8}$ of a grain) a quiet night's sleep was obtained, even in cases where Morphine and Codeine were ineffective. He has now about concluded to use this agent exclusively and expects the same good results.

Pertussis, although chiefly a children's disease, which generally passes through its regular course without serious complications, continues to receive close study by careful observers, and according to reports often its different stages have been mollified, but rarely entirely aborted. In the line of contagion some interesting observations by Dr. Weill, of France, have now been published after a study of the subject for 3 years. He originally claimed, and now produces some quite convincing testimony, that it is only contagious during the premonitory catarrhal stage. He has verified his results quite convincingly. On several occasions he allowed nearly 100 young children who had not previously suffered from Whooping Cough to be kept in the same ward with children suffering from this affection during the whooping stage, and to continue there for more than 20 days. In one case only was the affection contracted, and in this case the child from whom the affection was obtained was in the very earliest period of the whooping stage. Again he had an opportunity to avail himself of three small epidemics with the same results. He therefore quite rationally concludes that infection ceases very soon after the characteristic whoop begins, and that therefore in a family of children and others, it is not the patient who is already whooping, but his brothers and sisters who have not previously had the affection, who ought to be isolated.

Pharmacopœias are gradually becoming of more intrinsic value to the medical as well as the pharmaceutical world. The medical profession generally throughout the world, but especially in the United States, gives entirely too little attention to its national standard, but it is gradually realizing its previous neglect and is beginning to see how much better therapeutic results will be obtained if as much be given to the study of the basement principles of the medicaments used as to diagnosis. The one thing now being accomplished which is aiding the tendency to show more respect for the National Standard of each country, is the more frequent and more scientific revisions. Revisions are now in progress in several countries. The British and the Russian works are

announced for publication very shortly, having already occupied some time in their preparation. The initial steps have recently been taken for the revision of the French Codex and the Swiss and Italian Pharmacopœias. At the meeting of the Pan-American Medical Congress, which met in Mexico last November, a representative committee was appointed to arrange the details for a proposed Pan-American Pharmacopœia. This may be found to be impracticable but evidently the attempt is to be made.

Phenacetin (Para-Acet-Phenetidin), considered as a valuable antipyretic and analgesic, is now too well established to attempt to rehearse the innumerable favorable results. It has now reached that stage of its history in which no special mention is any longer made of its applications. Its abuse continues to be carried on unabated.

The following cachet is recommended in the treatment of migraine:

Antipyrin	0.50 grammes	(about $7\frac{1}{2}$ grains)
Phenacetin	0.10 “	(“ $1\frac{1}{2}$ “)
Acetanilid	0.05 “	(“ $\frac{3}{4}$ of a grain)

The caution is given that not more than 3 of these cachets should be taken in 24 hours, at least, at first (and the direction may be safely added: only under a physician's supervision). Another formula, in tablet form, is offered for the same purpose:

Caffein	0.065 grammes	(1 grain)
Phenacetin	0.260 “	(4 grains)

The following mixture is recommended by Dr. R. A. Laneaster, in the treatment of pertussis:

Tinct of Belladonna . . .	10 grammes	(154.3 grains)
Phenacetin	5 “	(77.2 “)
Whisky	15 “	(231.5 “)
Fl. Ex. of Castanea . . .	60 “	(about 2 ounces)

The dose for a child under one year is 10 drops, up to 10 years old 5 grammes (1 teaspoonful)—given at intervals of two to six hours.

Phenocoll (Amido-Para-Acet-Phenetidin)—the antipyretic—is now little used as such, for its Hydrochlorate is found to be preferable in most respects.

Variable reports are still made on its action in malaria, but those who find good results also report its successful application to hectic fever, various forms of neuralgia, as an antispasmodic and most

recently in influenza. In an epidemic of influenza in a certain locality in Italy 400 cases were treated with such gratifying results that this agent is to be continued permanently and exclusively.

In acute articular rheumatism the reports are also variable. It appears, however, that in most of the cases in which the pain was relieved it did not reduce the temperature. Dr. Max Ohly, of Halle, Prussia, reports his experiments on 16 cases of acute articular rheumatism, in which it acted promptly in relieving the pain in 13 cases. In three it failed (*Therap. Monatsh.*, Vol. X., page 676).

Dr. R. Guaita recommends the following mixture in pertussis :

Phenocoll Hydrochlorate ..	0.5 grammes (7.7 grains)
Antipyrin	0.5 “ (7.7 “)
Potassium Bromide	0.4 “ (6.5 “)
Syrup of Orange Peel	25.0 “ (about 6½ draehms)
Orange Flower Water. . .	25.0 “ (“ 6½ “)

He divides this mixture into 4 doses, to be taken at equal intervals in 24 hours. This is recommended for an 8 year old child. The treatment is continued for three successive days after which the Phenocoll is increased up to 1.2 grammes (about 18 grains), the Antipyrin up to 800 milligrammes (12.4 grains) and the Potassium Bromide up to 500 milligrammes (7.7 grains) which increased doses are kept up for 3 days more. Then again another increase is recommended of the Phenocoll up to 1.5 grammes (23.8 grains), the Antipyrin to 1 gramme (15.4 grains) and the Potassium Bromide to 600 milligrammes (9.3 grains) administered in 50 grammes (about 1½ ounces) of the vehicle. Dr. Guaita reports that if this treatment be followed out the frequency and intensity of the attacks are very rapidly diminished, and it tends to shorten the duration to a marked degree.

Phenamine is a name which has been recently given to Phenocoll apparently only for the purpose of coining the new name Triphenamine for the following mixture :

Phenocoll	2.6 grammes (40.0 grains)
“ Salicylate	1.0 gramme (15.4 “)
“ Acetate	0.4 “ (6.5 “)

Phesin is the name given to a new antipyretic analogous to Cosaprin. Just as this latter is a sulpho-derivative of Acetanilid, so is Phesin a sulpho-derivative of Phenacetin. It is presented in the form of a light amorphous reddish-brown, odorless, slightly acid and acrid powder, readily soluble in water.

Drs. Zoltán von Vámosy and Béla Fenyvessy, of Buda-Pesth, Hungary, have made a study of this agent and find its antipyretic action more prompt than Phenacetin, but of shorter duration—the temperature rising gradually.

Nothing is known of this agent in this country as yet.

Phthisis. The Rome (Italy) correspondent of the London *Lancet* has returned such a timely outline of The Latest Views on Phthisis and its primary and secondary causes, that it may be profitable to quote it here. It is given in what he calls the “full-dress discussion” in an Italian Medical Association in which the leading members took part (London *Lancet*, Vol. I. for 1897, page 214) :

“Fifteen years ago phthisis was accepted by most pathologists as co-extensive with tuberculosis. It was an infective disease determined by the action exerted on various organs by the bacillus of Koch. The objection that it could be infective and at the same time hereditary was met by the explanation that not phthisis *per se* but the predisposition to phthisis was hereditary. The children of phthisical parents were thus particularly vulnerable in presence of the bacillus, a neglected ‘cold’ or a slight influenza sufficing to invite the infection. The infective power of the bacillus was, indeed, the most formidable factor in the disease. No one was safe. Laboratory research showed the diffusion of the bacillus to be well-nigh limitless. Not only the air, but the food and drink, nay, the house furniture, the benches of schools, the compartments of railway carriages, the books of library shelves, and bank notes, all were potential or actual transmitters of the dreaded germ. 15 per cent. of the living harbored it; in the dead it was found in the ratio of 30 per cent. Panic at its ubiquity inspired the search for specifics against it. In spite, however, of antiseptic solutions, parasitocidal injections, and immunizing serums innumerable the bacillus refused to yield, cropping up mercilessly in the sputum, to confirm what used to be ridiculed as an Italian superstition—viz., the danger of living near, or succeeding to, people given to coughing and clearing the throat. Of late years, however, the panic has died down. Phthisis is acknowledged to be eminently curable. Under sound hygiene pulmonary tuberculosis is daily being arrested. Surgical intervention often suffices to cure a peritoneal phthisis. The sputum is seen to be dangerous only in a state of perfect desiccation. Even the breath of the phthisical may be respired with impunity. The bacillus of Koch, though still a power, is no longer supreme according to many pathologists.

According to others there are concomitant bacilli even more dangerous, to which that of Koch is simply the 'crossing-sweeper' facilitating their entrance. Thus, these observers explain the fact that in all the more pronounced cases of phthisis there are found other bacilli; while those cases in which the bacillus of Koch is alone detected are generally mild and run an easily tractable course. The hectic fever, symptomatic of the graver forms of phthisis, is accounted for by these concomitant bacilli only. Yet another group of pathological assailants the bacillus of Koch has to confront. These would assign it a simply accidental rôle—appearing in local manifestations merely, manifestations well defined and eminently curable. The disease caused by it is nothing more than a scrofulosis, in which the glands, the skin, the cartilages, and the bones disclose its invasion, with reaction for the most part favorable. The bacillus, for example, may lie hid in some viscus of a healthy subject whose resisting power by a blow or a wound is temporarily impaired, but which soon rights itself, to the expulsion of the intruder. Phthisis, according to the consensus of debaters led by Dr. Gatti at the Associazione Medica Lombarda, being not due to the bacillus of Koch, being neither infective nor contagious, resolves itself into what it appeared to be to the former generation—a disease of nutrition, a perversion of hygienic conditions due to causes economic, social, and others having their roots in our *modus vivendi*. The primary, the essential factor in the evolution of the phthisical state is degeneration, organic decay, while the intervention of the bacillus of Koch represents only 'unaccidente terminale,' a modification of a process already determined. In certain subjects, honeycombed by insufficient alimentation, tuberculosis is but an anticipation of the decomposition ensuing after interment. As, indeed, Virchow and Hanse-mann have shown, there are phthisical patients in whom the bacillus of Koch is 'conspicuous by its absence,' while there are maladies—diabetes, for example—in which tuberculosis is a complication almost invariably present. We return, then, to the pathology, the prophylaxis, and the therapeutics of our fathers—such, at least, is the outcome of the memorable discussion by the Milanese pathologists and consultants the other evening—and relegate to the first line among the causes and the cure of phthisis those factors and agents which have been temporarily pushed back into the second—factors represented by a violated hygiene, and agents recruited from the resources by which that hygiene is vindicated and restored."

Physostigmin (Eserin)—the poisonous principle of Calabar Bean—is recommended for the treatment of the glaucoma claimed to be so common on long sea voyages, by Dr. B. Schwarzbach, of London, W., England, who writes to the *Brit. Med. Journ.*, Vol. II. for 1897, page 324, as follows: “Knowing that through the medium of the *British Medical Journal* the attention of ships’ doctors may be reached, I beg leave to advise these gentlemen (or other medical practitioners who are in the habit of traveling extensively) to always provide themselves with eserin on long sea voyages. During four trips around the world I have had occasion to notice repeatedly attacks of glaucoma at sea, and on inquiry was always told by the ship’s doctor that eserin is not to be found in the ordinary medicine chest on board. And yet, in my belief, attacks of glaucoma occur comparatively more frequently at sea than on land. Only recently, during a trip from Australia, I had occasion to observe no fewer than four cases of increased interocular tension. Some little time ago, while traveling from Sydney to San Francisco, acute glaucoma developed after a severe attack of seasickness; the sight of the lady sufferer would certainly have been lost, had I not, with the consent of the ship’s doctor, performed an iridectomy then and there—and performed it under most difficult circumstances, and with instruments of rudest description. Since that time I always carry eserin when traveling at sea, and have frequently given help with it.

“I know a gentleman who is constantly traveling between New Zealand and England, and who during the whole duration of the sea trip used to see rainbow colors around lights, etc., the pupils of whose eyes looked unusually dilated, and the intersclerotic pressure used to be $T + 2$, though repeated ophthalmoscopical inspection gave a negative result. At my advice he now applies a weak eserin installation when at sea—every third day—and with the best advantage to his eyes, and without any injurious effect whatsoever to the system. I make this last remark, as with some ophthalmic surgeons a prolonged use of eserin seems to be out of favor.

“Other ophthalmological observations at sea (such as the occurrence of an attack of neuritis retrobulbaris after seasickness, etc., and also why, in my opinion, sea-life rather predisposes to glaucoma), I hope to be able to detail on a future occasion. At present I wish to draw attention only to the advisability of carrying eserin on long sea voyages.”

Piperazin (Di-Ethylene-Di-Amine) is still being used to considerable extent and has some importance, but practically nothing has been seen of it in the medical literature of the year.

Pixel, in the form of Dr. McKeon's Syrup of Pixel Compound, has not been alluded to during the year in the current medical journals. However, the formula given here last year is known to have been tried by more than one pharmacist but without any report upon it either one way or the other.

Pyoktanin (Methyl-Violet)—the analin dye "pus destroyer"—has not been much heard of during the past year. The most prominent articles written are the following: "A Clinical Study on the Use of Pyoktanin," by Dr. H. B. Young, of Burlington, Iowa, read before the Section of Ophthalmology of the American Medical Association at its meeting in Atlanta, Ga., in May, 1896. His experience is thus expressed—"occasionally very satisfactory, but more often disappointing, if not indeed aggravating" (*Journ. Amer. Med. Assoc.*, Vol. XXVII., page 1042). In the discussion which followed Drs. G. C. Savage and Price, of Nashville, Tenn., reported a case of successful application.

The second prominent article of the year was "Blue Pyoktanin in the Treatment of Inoperable Malignant Growths," by Dr. Henry R. Slack, of La Grange, Ga., read before the Georgia Medical Association on April 21st last, in which he relates five cases and concludes: "Pyoktanin, when properly used, is certainly a palliative treatment for cancer that deserves an honest, hopeful trial, for by its use many have been relieved and some cured." (?) (*Journ. Amer. Med. Assoc.*, XXVIII., page 1227.)

Pyramidon is the name given to a new antipyretic and analgesic introduced as a substitute for Antipyrin. It is a derivative of Antipyrin by a substitution process, giving chemically Di-Methyl-Amido-Antipyrin. It is described as a yellowish-white, almost tasteless crystalline powder, soluble in 10 parts of water. It is claimed by some to be much more active than Antipyrin, but this claim is modified by others to the extent that it is only slightly more active. It is evidently less soluble than Antipyrin, slower in producing its effects and more lasting in those effects. Its applications are naturally the same as those of Antipyrin, but the same results may be produced by about one-third the dose.

Dr. Wilh. Filehne, of Breslau, Prussia, has published his experimental and clinical investigations (*Berlin. klin. Wochensch.*, Vol.

33, page 1061). He finds its action prompt in relieving pain of various kinds, such as headaches of a febrile nature, pain in the lymph glands and the spleen in pseudo-leucæmia, tuberculous peritonitis, anæmia and multiple neuritis. Doses of 500 milligrammes (about 8 grains) produced neither subjective nor objective effects, and therefore the recommended dose of from 300 to 500 milligrammes (about 5 to 8 grains) was found effective when given three times a day. In 4 cases of nephritis it had little effect except in relieving the headache in one case of contracted kidney. It was of much benefit as an antipyretic in 12 cases including cases of tuberculosis, typhus fever, leucæmia, influenza accompanying pneumonia and the like. Its prompt action as an analgesic and its mild febrile action makes Dr. Filehne think that it is entitled to further trials.

At a meeting of the Paris Therapeutical Society, held on April 7th last, Dr. Huchard reported that he had made use of this agent in 24 cases with results like those produced by Antipyrin. He reports its toxicity in animals and advises caution.

Dr. R. Lépincé, of Lyons, France, has also made experimental and clinical observations. He has used it in 20 cases, with great benefit in most of them and no bad results in any (*Lyon Médical*, Vol. LXXXV., page 215).

Pyranthin (Para-Eth-Oxyl-Phenyl-Succinamic Acid)—the name given to the new substance obtained by the reaction between Phenacetin and Succinic Acid (the acid obtained by distilling amber)—has not been heard of in the literature of the past year. It gave promise this time last year of being a more important agent than any evidence has subsequently shown. It may be that further developments will be brought forward later, but for the present it may be considered as practically dead.

Quinosol (Chinosol)—the neutral antiseptic compound of Oxyquinolin with Tricresol, introduced as a substitute for Carbolic Acid, Corrosive Sublimate and Lysol—has had little mention made of it in the current medical literature of the year.

Dr. C. G. Moor, of King's College, London, England, reports that a 1 to 2000 solution of this agent will destroy the plague bacillus in 10 minutes, and a 1 to 3000 solution will destroy it in one hour (*Deut. Med.-Zeitung*, Vol. XVIII., page 768).

Resorcin (officinal) has been largely used during the past year, chiefly by the dermatologists who generally find it an efficient

agent. A few other uses have been made of it. The following powder has been recommended by Prof. Ewald, of Berlin, Prussia:

Resorein.....	4.5	grammes (about 75 grains)
Bismuth Salicylate..	15.5	“ (“ 240 “)
Tannigen	15.5	“ (“ 240 “)
Powd. Sugar	8.0	“ (“ 120 “)
Sodium Carbonate...	8.0	“ (“ 120 “)

The dose advised is 5 grammes (1 teaspoonful) given every 2 hours.

Dr. Strangways has obtained gratifying results with this agent in hay fever, but stipulates that it is quite necessary to remove the diseased conditions in the nose, for by this means often the attack can be aborted and possibly cured when his proposed nasal wash is made use of. He advises frequent washing with the following solution:

Acetic Acid.....	0.130	Cc. (about 2 minims)
Resorein	120	milligrammes (about 1½ grains)
Common Salt	260	“ (“ 4 “)
Water	30	Cc. (about 1 fluidounce)

Accompanying this frequent washing, hydrochloric acid is prescribed internally.

Dr. Roskam recommends this agent in the treatment of pertussis. During the past six years he has treated 290 children by the method introduced by Dr. Moneorvo, of Rio de Janeiro, Brazil, of applying a 2 to 3 per cent. solution of Resorein to the glottis with a fine sponge (*Ann. de la Soc. Méd.-Chirurg. de Liège*, Vol. 36, page 71).

Resorcinol—the name given to the resulting compound obtained by melting together Resorein and Iodoform—has not been heard of during the past year.

Rhubarb Root is such an important and well-known drug as it reaches the pharmacist and physician that it may be instructive to some to read a short chapter in its commercial history as given in the *Chemist and Druggist* (Vol. LI., page 333):

“The railway-schemes of the Russian Government, which will in a few years' time carry a Russian railway line into the heart of China, and the general advance of Russian influence on the northern and eastern borders of the Chinese Empire, make it very probable that early in the twentieth century some portion of the Chinese produce now carried by steamer from the treaty-ports of China to the European centers of production will be deviated to the overland route through Siberia. The freight by the overland route must necessarily be an obstacle, but need not be an insurmountable

one, and it is quite likely that some of the old caravan roads may be used until a point where they strike the railway. The caravan commerce between Russia and China has been an important one for many generations. At one time, as readers of 'Pharmacographia' will remember, the rhubarb seen in European commerce was almost entirely carried from China through Persia and Asia Minor (hence the old name of Turkey rhubarb), but later on it was brought through Northern China, Siberia, and European Russia to St. Petersburg. The history of the old Chinese-Russian rhubarb trade is almost forgotten now, but some interesting accounts of it are to be found in one or two rare books of travel. The principal of these, and the one from which most of the details given below are derived, is Pallas's 'Reise durch Verschiedne Provinzen des Russischen Reichs' (St. Petersburg, 1771). Much information is also contained in the Archives of the old 'Free Russian Trading Company,' at Moscow. Pallas resided for some time at Kiachta, the Russo-Chinese frontier town, where the merchandise was transferred from the Chinese caravan to the Russian one, and the rhubarb examined piece by piece by a Russian Government pharmacist. Commercial intercourse between Russia and China began early in the seventeenth century, but it was not put on a properly regulated basis until 1728. At first all the trade in the rhubarb exported from St. Petersburg to other European countries was a monopoly of the Russian Crown, and the name 'Crown rhubarb' still lingers to this day in the odd nooks of the German drug trade, as 'Turkey rhubarb' does in English popular parlance. In 1762 Catherine II. abolished the monopoly of the Crown export trade, but the business continued to flourish until the opening of the Chinese treaty-ports in the first half of the century, when rhubarb, musk, and other Chinese goods found a cheaper and more convenient outlet by water.

"The 'Russian' rhubarb of Pallas's time was evidently what is now known as the 'Shensi' variety; that now called 'Canton' was even then brought into trade by the port of Canton, and known in Europe as 'Indian' rhubarb.

"Concerning the commerce in rhubarb, Pallas says in his 'Reise':

"'The rhubarb is procured from the Bucharian merchants who come from the town of Selin, which lies southwestward of the Kokoi-Nor, or Blue Lake, on the borders of Thibet, and is subject to China, like all other towns of Little Bucharia.

“ ‘The best rhubarb purchased at Kiachta grows on a chain of rocks, lofty, and but sparingly provided with wood, which lie north of Selin, and stretch as far as the Koko-Nor. The good roots are distinguished by large and thick stems. They are dug up in April or May, immediately cleansed from the soil, and hung on the neighboring trees to dry; then wrapped up in woolen sacks, carefully preserved from the least humidity, and transported upon camels to Kiachta.

“ ‘The exportation of the best rhubarb is prohibited by the Chinese, under the severest penalties. It is procured clandestinely, however, in sufficient quantities, sometimes by mixing it with inferior roots in the caravan load, and sometimes by means of contraband trade. The College of Commerce at St. Petersburg has the sole right of receiving the root, and appoints agents at Kiachta for that purpose. Much care is taken in the choice, for it is examined in the presence of the Bucharian merchants by an apothecary commissioned by Government, and resident at Kiachta. All the worm-eaten roots are rejected, the remainder bored through to ascertain their soundness, and all the damaged or decayed parts are cut away. By these means even the best roots are diminished a sixth, and the refuse is burnt.

“ ‘When Catharine II. abolished the Crown monopoly in the export trade of rhubarb from Russia a heavy duty was put on the root, which private traders had to pay. The root imported by the Crown was sold at St. Petersburg through the intermediary of the College of Commerce for the profit of the Sovereign. The current price was settled every year by the College.

“ ‘Rhubarb was taken from the Bucharian merchants at Kiachta in exchange for furs; the prime cost was about 16 roubles (32s.) per pood of 35 lbs. By adding the pay of the commissioners who purchased it, and of the examining apothecary, and allowing for other necessary expenses, the value of a pood at Kiachta amounted to 25 roubles, to which had to be added about 5r. for carriage from the frontier to St. Petersburg. In the year 1765 1,350 poods were exported from Russia, valued at 65 roubles per pood, so that there must have been a fine profit left for the merchants. That seems to have been an unusually brisk year, for upon an average the annual receipts at Kiachta only amounted to 1,000 poods, of which about 700 passed the official inspection.’ ”

Roentgen Rays are assuming a position of rapidly increasing importance in the scientific world. Their application to medical use

is only a very small part of the field which they now occupy, but this part alone is a complete study by itself.

At a meeting of the Paris Academy of Medicine held on June 1st last Dr. A. Combé communicated an ingenious application of skiagraphic methods to the bones of the face: "He hangs a delicate photographic film, which has been carefully preserved from contact with the light, upon an artificial palate modeled in vulcanite exactly to the oral cavity of the subject. This, when placed in the mouth, can be maintained in position by the closure of the jaws. The rays from the bulb are directed perpendicularly on the region it is desired to photograph, the exposure being from six to eight minutes. The tube employed is a bi-anodic bulb giving a spark of 45 c.m. The skiagrams obtained showed, among other things, the anterior part of the superior maxillary bone, in which the roots of the incisors and canine teeth were very clearly visible, and in the substance of which the least tumor would have become obvious. Another curious development in X-ray photography has been obtained by Messrs. Lays and David, who have exhibited at the Biological Society some skiagrams representing what they term 'effluves,' given off by the eye and finger in the normal condition, and their results will have much interest for occultists and dabblers in electro-biology. Messrs. Lays and David have employed a new method, which had, however, already been mentioned by Dr. G. Le Bon. It consists in the immersion of the fingers of the subject in an hydro-quinone bath, the fingers being applied by their palmar surfaces to a plaque of gelatino-bromide of silver in the dark for some quarter of an hour or twenty minutes. As a result the observers believe thus to have demonstrated that there emanates normally and continually from the human body during a state of wakefulness a special fluid which they consider 'the essential manifestation of life.' This phenomenon is similar to that which Colonel Rochas has recently sought to demonstrate under the name of 'externalization of sensibility.' To the imaginative all sorts of possibilities will present themselves as the result of the study of this 'essential manifestation.' By watching the variations of this nerve force taking place in accordance with the age, sex, different times of the day, different environments, and different mental conditions, assistance may be gained in the study of physiology and pathology, while the absence of 'les effluves' may possibly furnish that sign for which so many are now looking—an

inecontrovertible proof of death." (London *Lancet*, Vol. I. for 1897, page 1641).

Prof. Diakonof reports "that he has made a varied and most instructive use of the Roentgen rays in preparing radiographs of anatomic preparations. Structures like arteries, veins, bronchi and bronchioles may be injected with various materials more or less opaque to the X-rays, and the resulting radiograph shows with perfect accuracy their relative distribution. The best material for injecting is mercury, on account of the ease with which it can be manipulated and the fact that the same injecting fluid can be used over and over again. When it is wished to inject two sets of vessels in the same organ and to show their distribution in the radiograph, mercury may be injected into one set and a still more opaque material into the other. The following mixture is suggested: Gypsum, cinnabar and red lead, twenty parts each; flour, ten parts; add enough water to make the mixture sufficiently fluid to flow into the smallest vessels. This mixture is too opaque, and the resulting shadows in the skiagraph too black, to be recommended as a substitute for mercury, but it is useful in combination with it as a contrast." (*Journ. Amer. Med. Assoc.*, Vol. XXVIII., page 993).

At a meeting of the Paris Academy of Sciences, held on November 2d last, Drs. Charles Remy and Contremoulin brought forward several radiographs which represented various anatomical specimens photographed by means of these Rays in the histological laboratory of the Paris Medical Faculty.

"One of these radiographs, representing the hand, forearm and part of the arm, was obtained by a single sitting. The arteries are plainly seen, with finer details than could be obtained by dissection. Very small arterioles are perceptible, and the distribution of the large vessels can be followed everywhere in the radiograph, even through the bones. Their relations to the latter could not be better shown; the radial artery is seen through the radius, and the palmar arch through the metacarpal bones.

"Another radiograph shows the five fingers of one hand, with all the vessels perceptible, the tufts at the extremities of the fingers being particularly worthy of notice.

"The great advantage in anatomical research of being thus able to photograph the vessels without opening the limbs is obvious.

"This method of investigation promises also excellent results in respect of the circulation in the embryo.

“We have rendered the vessels visible by injecting, at the suggestion of Prof. Marey, metallie powders, suspended in various liquids; the results obtained with bronze powder in an aleoholic solution of wax are especially excellent.

“The Roentgen rays may also be employed with advantage in investigating the points of ossification, as is shown by the radiograph of a fœtus before term.

“Lastly, it may be resorted to for studying the development of the teeth, which are thus rendered visible in the jaws without the artifices which have been necessary hitherto. A preparation, moreover, showing the same appearances, would by this very act of preparation, as a result of the caustic effect of the preservative liquids employed for this purpose, inevitably lose much” (*Medical Week*, Vol. IV., page 547).

Dr. Max Levy-Dorn has made an examination, in a case of asthma, with these Rays and relates it in *Berliner klin. Wochensch.*, Vol. 33, page 1046.

The further investigation into the action of these Rays on pulmonary tuberculosis have not been very favorable. Drs. Bergonié and Mongour, of Bordeaux, France, report that in two cases of the acute form in which alcoholism and privation complicated the condition, the influence of these Rays was entirely negative, both locally and generally. In three cases, however, of the chronic form there was prompt general improvement. During six weeks the general and local improvement was evident, but after that a further development of tuberculous material occurred. In three other cases the affection ran its customary course apparently uninfluenced by the Rays. These two observers conclude that probably the parenchyma of the lung under the influence of these Rays becomes so organized that it is far more able to resist the attacks of Koch's bacillus.

Drs. Chapteloube, Deseomps and Roulliés describe the effects of these Rays upon a woman 22 years old with acute and rapidly spreading pulmonary tuberculosis:

“There was a cavity at the right apex, the whole right lung was infiltrated, and there was generalized extension to the left lung; the sputum was crammed with tubercle bacilli. Medical treatment had no effect upon the symptoms; hectic supervened, and the patient rapidly lost ground. All medicines were accordingly left off, and the influence of the X-rays substituted. During the first fortnight

of their employment, which was much resented by the patient, the general condition became worse. At the eighth application a kind of crisis occurred with a fall of temperature, which had, however, risen again to 103.2° by the end of the fortnight. At this time there could be noticed some improvement in the right infraclavicular fossa. During the next month the rays were used from behind twice a day; this resulted in a marked drying up (fibrosis) of both lungs, diminution in cough and expectoration, and almost complete disappearance of tubercle bacilli. At the same time the general condition remained grave, and ulcers appeared on the exposed parts. The use of the rays was discontinued, and during the next three weeks a great improvement took place. The patient who had hitherto refused food, regained her appetite, the healing of the pulmonary lesions continued, together with the diminution of the cough and the bacilli, and the greater ease and depth of respiration. The diarrhoea disappeared and the strength returned; the temperature alone kept up (101° in the evening), which the authors explain as being probably due to bacillary infection of some other part than the lungs. The authors conclude that, without discussing the question of a permanent cure, in thirty sittings the *x*-rays have favorably affected and almost healed lungs affected with acute tuberculosis, no other medicinal agent being employed at the time." (*Epitome Brit. Med. Journ.*, Vol. I. for 1897, page 95.)

As a means of diagnosis there appears to be more hope from the use of these Rays if anything like positive statements are desired. Dr. Charles Bonchard has found that if a patient be placed between a Crookes' tube and a fluorescent screen, that side of the thorax occupied with a pleuritic effusion showed darker than on the other side if not affected. Of course, if some parts were affected and others healthy in the adjoining region the tint would vary. Percussion and auscultation verify any consolidation present and lead one to draw definite conclusions. In two cases, however, cavities were diagnosed as abnormal when nothing was seen by these Rays. In another case where the general symptoms pointed to the beginning of pulmonary tuberculosis, but where there were no abnormal physical signs and where the bacilli in the sputum were absent, these Rays showed that one apex was more solid than the other—the expected physical signs and the bacilli appeared a few days later, thus the Rays anticipated the final result (*Semaine Médicale*, Vol. 16, pages 513 and 522).

At a meeting of the Paris Medical Society of the Hospitals held on January 15th last, Dr. Rendu, of Paris, France, opened the discussion on the "Treatment of Acute Inflammation of the Thoracic Viscera" by these Rays by bringing before it the case of a young man 20 years old with an infective pulmonary complaint, the nature of which could not be exactly made out. There were evident characteristic typhoid symptoms present at first which were followed by all the signs of typical infective pneumonia, which was apparently confirmed by the presence of the staphylococcus. Drs. Du Castel and P.-E. Lannois took part in the discussion. The subject is an interesting one and will be found instructive to those who desire to look it up (*Bulletins et Mémoires de la Soc. Méd. des Hôp. de Paris*, Vol. 14, page 41).

At the recent meeting of the German Congress of Internal Medicine, held in Berlin, Prussia, in June last, the subject of these Rays in medicine was under discussion. Prof. Benedikt, of Vienna, Austria, discussed the subject in relation to the heart. He said :

"The study of the movements of the heart by the aid of the X-rays has greatly modified our conception of the extent of the contractions and the displacement of the apex. They enable us to make out the size of the right and left cavities, and the relationship between the heart and the diaphragm ; the latter may be immobilized by adhesions of the pericardium. Radiography may even be utilized for the investigation of valvular lesions, as it gives valuable information on the condition of the vessels.

"On the other hand, the study of the respiratory movements of the diaphragm by means of the Roentgen rays presents great interest. The localization of pulmonary lesions may be exactly recognized. In Pott's disease at the onset a definite diagnosis is of great importance, and the use of the X-rays in this particular case is therefore of advantage to the clinician.

"With regard to the abdominal organs, it is difficult to get a good view of the intestine, unless it is empty and the subject is very lean. Photographic proofs in this case give better results than the screen."

The discussion which followed is interesting :

"Dr. Levy-Dorn (Berlin).—When the aorta of an apparently healthy subject is examined, a very slight dilatation is found to exist at the convex portion of the arch, a condition which is so frequently met with that it may be normal. Aneurisms, no matter

how small, are very distinctly seen, even when there are but slight clinical symptoms or none at all. I have seen a dilatation of the left portion of the arch of the aorta, which manifested itself solely by paralysis of the recurrent nerve.

“Aneurisms may be distinguished from solid tumors in contact with the aorta (tumors of the œsophagus or mediastinum) by their very distinct pulsation.

“Dr. G. Rosenfeld (Breslau).—By introducing into the stomach a long slender sound, the X-rays enable us easily to see the greater curvature of this organ. To clearly distinguish the abdominal organs from each other, the source of the rays must not be made too strong, as the shadows are more distinct with less intense rays. A floating kidney may thus be readily seen.

“Dr. Rumpf.—It is of great importance that the source of the rays be absolutely immovable. Tubes suitable for the fluoroscopic screen differ from those used for photographic proofs.

“Dr. Scheier (Berlin).—The Roentgen rays have thrown light on the mechanism of phonation. The situation of the velum palati, of the tongue, of the lips, and of the epiglottis in pronunciation of the consonants and vowels appears to be different from what has hitherto been supposed.” (*Medical Week*, Vol. V., page 304).

At a meeting of the Paris Academy of Sciences, held on April 5th last, Drs. G. Seguy and F. Quémisset discussed the action of these Rays on the heart. They stated that they had “simultaneously observed that prolonged exposure to the X-rays results in peculiar cardiac disturbances, consisting of extreme palpitation with very irregular heart action, as one of us found by repeated experiments on himself, the other by long continued experiments on another person for the purpose of ascertaining the therapeutic effects of these rays. The patient at first experienced a sensation of severe oppression, followed by violent and irregular beating of the heart, which became absolutely unbearable and dangerous when the Roentgen rays passed through the chest, so that it became necessary to protect the parts in question by a metal sheet sufficiently thick to intercept the radiations.” (*Medical Week*, Vol. V., page 200).

Dr. E. Aron, of Berlin, Prussia, discusses the early diagnosis of aortic aneurism with the aid of these Rays and gives two cases. He draws attention to the importance of examination by these Rays in making an early diagnosis (*Deut. Med. Wochensch.*, Vol. 23, page 342).

In relation to the treatment of skin diseases Dr. Leopold Freund, of Vienna, Austria, related, before a meeting of the Vienna Imperio-Royal Medical Society held on January 15th last, a case of naevus pigmentosus pilaris involving the neck, back and upper part of the arm, in which he made use of these Rays for treatment. Apparently the hair of the head was removed with greater facility than that growing on the naevus. Upon examination of the hairs microscopically the roots were found to be atrophied or swollen (*Medical Week*, Vol. V., page 47).

In the *Bulletin of the Johns Hopkins Hospital* (Vol. VIII., page 17) Dr. T. C. Gilchrist relates A Case of Dermatitis due to these Rays, and gives an interesting table of the cases which he has been able to find in the literature on the subject. He closes with three excellent photographs illustrating his remarks.

At a meeting of the Sheffield, England, Microscopical Society, held on November 6th last, Mr. Frank Harrison, Dental Surgeon, read a paper on the employment of these Rays in the practice of Dental Surgery. He gave an account of a remarkable incident that occurred during his experiments which caused him some alarm. He subjected the right side of the face of a patient to these Rays on a certain day. For the next 25 days or so many exposures were made. Following these the patient complained of itching and a burning sensation with slight redness on a certain day. The following day the redness had much increased in color resembling erysipelas. A few days following again the hair over this part began to fall out which continued until the whole right side of the face was bald, showing glossy skin in small wrinkles. In six weeks' time the hair began to grow again and is now in its normal condition.

Prof. Thorner "has been experimenting on the action of the X-rays on various salts and foodstuffs. As a rule, he finds that organic bodies are readily penetrated by the rays, while inorganic substances are more resistant, except boric acid, borax, lithium carbonate and the diamond; all these are readily penetrated. Foodstuffs which have a low ash offer very little resistance to the passage of the rays. Flour, honey and sugar are practically transparent, but when mineral matter is added to them the mixture becomes markedly more resistant. Fats have the same properties. Butter mixed with salt is distinctly more opaque than the fresh article. Wheaten bread is more penetrable than that of rye, and brown bread least so of all. The author

considers that this penetrability of bread depends in a great measure on the porosity of the loaf, and that therefore a more transparent bread is likely to be most digestible. Adulterations of coffee berries are readily recognized by means of the X-rays, fictitious berries made of breadcrumb being much more translucent, while berries made of clay or other inorganic matter are practically opaque. Tea-leaves that have been faced with inorganic coloring matter give a much darker shadow than the natural leaves, and even bad hazel nuts may be separated from good ones without cracking them by means of the X-rays. With silk the penetrability is inversely as the amount of ash given on incineration. Horn is more transparent than bone. Celluloid is readily penetrated. Paste stones offer distinctly more resistance to the passage of the rays than genuine diamonds." (*Pharm. Journ.*, Fourth Series, Vol. V., page 299.)

"Professor Roentgen has again made a communication to the Royal Academy of Sciences on his great discovery. He states that while the x-rays are passing through the air they traverse it in every direction. When a plate impervious to the rays is placed between a fluorescent screen and a source of the rays, so that the screen is overshadowed by the plate, the platinocyanide of barium nevertheless becomes luminous, and this luminosity is visible even when the screen lies directly upon the plate, so that one might imagine that some rays had traversed the plate; but if the screen placed on the plate is covered by a thick piece of glass the fluorescence becomes weaker and disappears completely when the glass is replaced by a cylinder of lead 0.1 cm. ($=\frac{1}{2}$ of an inch) in thickness surrounding the fluorescent screen. Professor Roentgen's explanation of this phenomenon is that x-rays emanate from the irradiated air. He considers that if our eyes were as sensible to the x-rays as to ordinary light the appearance would be as if a candle were burning in a room filled with tobacco smoke. Professor Roentgen has, moreover, invented a new apparatus for measuring the intensity of the x-rays. He has succeeded in ascertaining by means of this apparatus that the intensity of the rays is influenced: (1) by the course of the primary current; (2) by the interposition of a Tesla transformer; (3) by the rarefaction of the air in the tube; and (4) by some other agencies not yet known. He concludes (1) that the rays issuing from a discharging apparatus consist of a mixture of rays of different absorbability and intensity; (2) that the combination principally depends on the course of the discharging current; (3) that

the absorption of the rays varies according to the absorbing medium; and (4) that as the x-rays are produced by the kathode rays, and have similar fluorescent, photographic, and electrical qualities, it is very probable that they are both phenomena of the same nature." (London *Lancet*, Vol. II. for 1897, page 60).

Great progress has been made all along the same lines as alluded to here last year, but the literature is so voluminous at this time that it would be quite impracticable to attempt to rehearse it all. Therefore the above few main points only have been quoted as being some of the newer ideas and channels occupying the scientific medical minds.

The public in general have become so impressed with the wonderful developments with these Rays that they have often laughingly shown a tendency to make the subject take a ridiculous turn, for if almost anything is in doubt or goes wrong, they recommend to subject it to the x-Rays. This application to quite every possible object is not confined to the uninstructed, for the scientists themselves now quite instinctively turn the Rays on almost every object of study. The following new use for these Rays was indicated by Mr. Heycock in a recent lecture reported by The London *Electrician*:

"The lecturer," it says, "drew attention to the fact that the composition of metallic alloys is and always has been a vexed question; that is to say, it has always been very doubtful whether the metals which compose the alloys form a homogeneous mixture, or whether they exist as small distinct particles which are capable of being separated from one another. Now, some metals, such as sodium, permit of the passage through them of Roentgen rays, while others, such as gold, prove to be quite opaque when submitted to the radiation from a Crookes tube. Having made an alloy of sodium and gold, containing a very small percentage of the latter metal, he allowed it to cool very slowly, just as the solution of potassium permanganate in water had cooled. When cold a very thin section was cut, which was then radiographed. The radiograph revealed the fact that the sodium had crystallized out from the general mass. This is one of the most interesting results which have been brought about by means of X-rays, and it opens up a wide field of research in microscopic photography which will probably enlighten us considerably with regard to the true nature of alloys. The atomic weight of sodium is 23 and that of gold is 197, so that sodium is roughly

eight times more transparent to X-rays than gold. The atomic weight of carbon, on the other hand, is 12, and that of iron is 56, so that their transparencies are only as 5 to 1. However, the difference is sufficiently large to warrant the X-ray research into the true nature of the various brands of steel and iron." (*Pharm. Era*, Vol. XVII., page 689.)

"The ways of the smuggler are, it appears, actually being revealed to some extent by the aid of the Roentgen rays in France, an apparatus devised by M. Gaston Seguy being utilized for the purpose. This is an adaptation of the fluorescent screen in the form of an opera-glass, the lenses being replaced by discs coated with uranium salts, and it has been called 'La Lorgnette Humaine.' The results of a demonstration at the Bercy Customs Warehouse, which was witnessed by two members of the Academy of Sciences and other notabilities, are thus summarized by the Paris correspondent of the *Daily News*: 'A case labeled china was first examined. The opera glass showed it contained an oval dish. Another parcel, invoiced as boots, revealed a pair of ladies' boots, but along with them were two round balls. 'Open,' ordered M. Pallain. The two balls were found to be apricots sent from Algeria. A box returned as 'samples' aroused the suspicion of M. Pallain, who remarked that this word was often a euphemism for tobacco. The opera glass was directed upon it, when three tin boxes were seen, each of which contained a hundred Egyptian cigarettes. Two boxes of English matches were packed up with them. These experiments were continued for an hour, and excited great enthusiasm.' The M. Pallain referred to above is the Director-General of Customs, and the packages examined appear to have been sent by parcel post. It is quite evident that the authorities will have plenty of work on their hands if they intend to examine all such parcels by radiographic methods, and delay in delivery, it may be presumed, is regarded in Paris as of quite secondary importance." (*Pharm. Journ.*, Vol. V., Fourth Series, page 32.)

"The light emitted by glow-worms is still engaging the attention of physicists. That it possesses some of the properties of *x*-ray light was announced in this country last year by Dr. Dawson Turner. Professor Muraoka, of Tokio, working with the light emitted by 300 worms, states in a recent number of *Wiedemann's Annalen* that it behaves very much as ordinary light, except that when filtered through card-board or metal plates it shows the properties of *x*-rays.

It thus seems that it is a mixture of ordinary and x radiations. It is also asserted to contain radiations which have the properties of Becquerel rays. Very possibly the light emitted by the animal comprises rays extending over a very long series of wave lengths. Working with Becquerel's rays an American observer has succeeded in obtaining photographic records. The object to be photographed was placed in direct contact with a photographic plate in a dark slide, and on this was placed the substance under experiment, and of which it was desired to obtain a radiograph, the whole then being protected from daylight. Some very good negatives are said to have been obtained. We are not told, however, that precautions were taken to guard against the possibility of any direct contact effect. The fact that no results were obtained when sheets of metal or glass were interposed suggests a similarity as regards transparency to the x -rays. The best results were obtained by using granulated sugar, which had been exposed to sunlight as the source of the rays. Using this substance as a source the rays were made to traverse a thickness of over 2 inches of wood. In some of the experiments two shadows at right angles to each other were obtained. It will be remembered that a similar curious effect with the radiations from a glow lamp with a broken filament was recorded in these columns at the beginning of last year." (*Brit. Med. Journ.*, Vol. I. for 1897, page 421.)

Rose Leaves have been suggested by Mr. E. N. Gates, of Holliston, Mass., to mask the taste of Quinine Sulphate. The Syrup of Rose Leaves was used, made with Simple Syrup 3 parts by volume and Fluid Extract Rosae Centifolia 1 part. Three trial mixtures were made containing 130, 325 and 650 milligrammes (about 2.5 and 10 grains) of Quinine Sulphate to 3.5 Cc. (about 1 fluid-drachm) of the Syrup. Several independent observers reported that the Quinine taste is thus entirely covered up in all the mixtures tried—the peculiar bitter taste of the Rose Leaves only being noticeable. Immediately the mixtures are diluted with water, however, the taste of the Quinine becomes evident again.

Salol (Phenyl Salicylate)—official—has been largely used during the past year, especially by the surgeon. The general practitioner, however, is making use of it, with less but not discouraging success. Its quite frequent and increasing use in the treatment of acute rheumatism is apparently not without its drawbacks. Dr. H. B. Carpenter strongly advises against such use and throws out the reminder "that it contains about 36 per cent. of carbolic acid, and

in order to produce the physiologic effect of salicylic acid one runs the danger of carbolic-acid poisoning. In a case recently in which salol was given in conjunction with phenacetin (2½ grains of each) not only was the amount of urine passed reduced, but the urine became bloody." (*Phila. Polyclinic*, Vol. VI., page 176).

Dr. G. Dieballa, of Buda-Pesth, Hungary, reports a case of severe progressive anæmia in a 15 year old patient which had resisted for five months such agents as iron, quinine, bone-marrow, arsenic and inhalations of oxygen. No cause for this condition could be determined, and as the patient was rapidly becoming worse, even to delirious attacks setting in, Salol was resorted to. Auto-infection was suspected and the doses given of Salol were 1 gramme (15.4 grains) 5 times daily. The patient's condition began to improve immediately. Whenever the doses were suspended the previous symptoms returned. However the doses were gradually diminished from 5 grammes (77.2 grains) a day to 3 grammes (46.3 grains) and in 3 months' time it was found possible to discontinue the administration entirely, for the patient had recovered his previous good health and the anæmia disappeared.

According to Dr. Carron de la Carrière, the internal use of this agent in angina has produced very gratifying results. He has prescribed it in cases of amygdalitis, acute angina and non-diphtheritic cases no matter what their cause might be. It proved to be a general antiseptic and analgesic, especially effective in the region of the pharynx. It appears to mollify the pain and relieves dysphagia immediately, showing a rapid improvement in all the physical symptoms. It appears to prevent the formation of abscesses and shortens the duration of the affection, especially when given early. The daily quantity of Salol given an adult was 4 grammes (about 60 grains). Dr. de la Carrière recommends the following formula :

Salol	2 grammes (about 30 grains)
Oil of Sweet Almond. 4	" (" 60 ")
Simple Syrup 29	" (" 450 ")
Distilled Water 74	Cc. (about 2½ fluidounces)

This formula supplies sufficient for 3 doses during a day. It has the advantage of being well borne at all times, and as it does not disturb the digestion it can be given at meal times. Particular attention is called to the fact that its use should be suspended if the urine appears dark at any time.

At a meeting of the Paris Academy of Medicine held on March 30th last Dr. Brossard, of Cairo, Egypt, offered a paper on intestinal obstruction resulting from Salol calculi and read by Dr. Albert Robin. In one case 12 calculi weighing in all 4 grammes (61.7 grains) were evacuated after energetic treatment for the complete occlusion resulting, which proved to be composed of Salol—the largest weighed 2 grammes (30.9 grains). The curious feature of the case was that the doses of 4 to 5 grammes (61.7 to 77.2 grains) daily for 10 days in the form of powder were evacuated in these calculi of crystalline formation, showing evident solution in the intestinal tract followed by crystallization (*Bull. de l'Acad. de Méd.*, Vol. XXXVII., page 358).

Mr. C. R. Marshall, Asst. Professor of Medicine in the University of Cambridge, England, writes to the *British Medical Journal* (Vol. II. for 1897, page 78) as follows :

“Some time ago Professor Bradbury sent me an almond-shaped crystalline mass, possessing a yellowish color and weighing about 1 gramme, for examination. It was said to have been vomited by a young lady who had been taking salol for some months. The drug had been ordered for intestinal flatulence, and had given marked relief. For nearly six months a cachet containing 10 grains was taken once or twice daily. Then attacks of severe colic, accompanied by vomiting, occurred, which nothing would relieve except the hypodermic administration of morphine. In one of these attacks the body in question was brought up, and at the time the statement was volunteered that similar masses had been frequently passed by the bowel. The substance had a salol-like odor, and gave the chemical tests of this compound. The melting point was almost correct, so that the substance was practically pure. The salol was stopped, and the patient improved. Dr. Bradbury tells me that no further attacks have occurred.”

He goes on then to discuss the question and concludes : “The importance of the formation of salol calculi, apart from the serious symptoms to which they may give rise, lies in the fact that the activity of the drug is markedly diminished. Even in the intestine a mass of salol can only be acted on slowly by the intestinal juices and microbes, and probably a great part passes on unchanged. This slow action all along the intestinal tract may be an advantage in some conditions, but it is certainly not in all. The chief fault seems to be in the method of administration. Salol—and the same

thing holds good for other insoluble bodies of similar melting point—ought to be rubbed up with some innocuous powder, or given in the form of an emulsion, as recommended by Sahli. In this way the activity of the drug is not diminished, and the possibility of calculus formation is reduced to a minimum.” (*Brit. Med. Journ.*, Vol. II. for 1897, page 78).

A new compound of this agent Tri Brom-Salol has been given the trade name of “Cordol,” containing 53.21 per cent. of Bromine. It is described as a colorless, odorless, crystalline powder, insoluble in water, difficultly soluble in alcohol and ether, but readily soluble in glacial acetic acid, acetone and chloroform. It is recommended as a sedative, antirheumatic and antineuralgic in doses of 500 milligrammes to 2 grammes (7.7 grains to 30.9 grains) three times a day. Dr. Josef Rosenberg, of Berlin, Prussia, has carried on clinical observations with this compound. He has been able to afford sleep in patients suffering from insomnia from any cause whatever. His results have been favorable in cases of urticaria in which the itching was so intense that sleep was practically impossible. He believes that this new compound deserves a prominent place as a therapeutic agent.

Salophen (Acetyl-Para-Amido-Salol)—containing 51 per cent. of Salicylic Acid—continues to be used in acute articular rheumatism, and appears to be largely confined to that use for its best results. Dr. De Wannemaeker, of Ghent, Netherlands, however, has met with very encouraging results in pruritus. He gives 4 to 5 grammes (61.7 to 77.2 grains) a day internally. He has made use of it in long-standing cases of prurigo, urticaria, seborrhœic eczema and in a yearly recrudescence of psoriasis. Its effects, however, were not always favorable and he is in doubt whether its effectiveness is due to the salicylic acid or the carbolic acid. The above is alluded to in his paper on “Pathology and Treatment of Pruritus,” and will be found in *Wien. Medizin. Blätter* (Vol. XX., page 145).

Salubrol is a new general antiseptic offered as another substitute for Iodoform. Dr. Schuftan describes it chemically as Di-Methylene-Antipyrin Bromide, and is formed by the reaction between Bromine and a combination of Methylene and Antipyrin. Apparently Dr. Max Silber, of Breslau, Prussia, was the first to employ it. He reports it as an excellent antiseptic in the form of a dusting powder in the treatment of small abscesses, boils, burns and the like—superior to Iodoform. Experiments upon animals

show it to be non-toxic and powerfully germicidal in its action (*Deut. Med. Wochensch.*, Vol. 22, page 843). It is nearly odorless and splits up when coming in contact with the organic secretions present in suppuration and in open wounds, slowly liberating Bromine. It slightly irritates when first applied in powder form, but this soon passes off and rapid cicatrization takes place. A 20 per cent. gauze appears to be the favorable form of application, for no irritation occurs. It is reported that cicatrization takes place too quickly for it to be of service over large surfaces, for thus healthy granulations are prevented.

Salufer—the trade name given by a manufacturer in Leeds, England, to Potassium Silico-Fluoride—has not yet been heard of in this country. In fact nothing new has been noted even abroad.

Sanoform (Di-Iodo-Methyl Salicylate)—the Iodoform substitute containing 62.7 per cent. of Iodine—has been little heard of in the current medical literature of the year. However, Dr. Philipp Sternberg, of Berlin, Prussia, relates his favorable results in 90 cases. 37 were fresh wounds. After cleansing the wound thoroughly the powder was applied copiously with an occlusive bandage. The bandage was changed after two to four days at which time the wound had healed in most of the cases. If called for, a second dressing is applied when in all cases healing is accomplished. There was suppuration, abscesses, paronychia and the like in 28 cases. In these, lancing and curetting were first accomplished. After the bandage was removed the wound was found completely dry, and upon removal of the second bandage healing was complete. 14 cases of fissures and rhagades were treated with a 10 per cent. ointment consisting of Sanoform and Lanolin, and healing was accomplished in a very short time. 6 cases were tamponed with sterilized gauze (*Therap. Monatsh.*, Vol. XI., page 380).

Somatose—the tonic and nutrient—has had comparatively little additional testimony offered during the past year, although it is still largely in use. The Somatose Biscuits seem to meet a very decided want and those who have used them speak highly of the results.

Dr. A. Lataud, of Paris, France, alludes to the peculiar and powerful anti-emetic action of this agent in the treatment of persistent vomiting, either in pregnancy or after chloroform anesthesia. He claims to have controlled a number of rebellious cases. More than 20 grammes (4 teaspoonfuls) should not be taken per day.

as otherwise diarrhea is apt to occur (*Journ. de Méd. de Paris*, Vol. IX., Second Series, page 196).

Sozo-Iodol (Di-Iodo-Para-Phenyl-Sulphonic Acid) — known also as Sozo-Iodolic Acid—the Iodoform substitute, is still in use especially in the form of combination with either ammonium, mercury, potassium, sodium or zinc. The rhinologists and laryngologists are apparently the chief users of these products.

In the new edition (fifth) of the Russian Pharmacopœia about to be published, this agent will be found as being one of the more recent products of sufficient value to be thus officially recognized. Curiously enough what appears to be the least used of the above compounds—Ammonium Sozo-Iodolate—is also to be recognized.

Stypticin—Cotarnine Hydrochlorate—has not been commented upon during the year past.

Sulphonal (Di-Ethyl-Sulphon-Di-Methyl-Methane) continues to be very largely used, and the abuse of it goes on without any apparent abatement. The relief given in acute mania, epilepsy, insomnia of melancholia and night-sweats of pulmonary tuberculosis continue to be verified by reports put upon record during the year.

Those interested in following the cases of poisoning may add to their list the following: A Case of Fatal Chronic Sulphonal poisoning by Dr. Richard Schnitz, of Braunschweig, Germany (*Neurol. Centralbl.*, Vol. 15, page 866); A case of melancholia agitans in which poisoning occurred, related by Mr. F. P. Hearder, of Wakefield, England (*London Lancet*, Vol. II. for 1896, page 1372); a fatal case of acute Sulphonal poisoning by Drs. G. Hoppe-Seyler and C. Ritter, of Kiel, Prussia (*Münch. Med. Wochensch.*, Vol. 44, page 355), and A case of rheumatism in which Sulphonal poisoning occurred (a coroner's case) related in the *Chemist and Druggist*, (Vol. LI., page 316).

Sutures. Dr. C. Haegler-Passavant, Asst. to Dr. A. Socin, of Basle, Switzerland, "calls attention to the excellent qualities of wire made of a mixture of 95 parts of copper to 5 of aluminium, which has been used for some time now in the Professor's wards.

"These wires measure .22 millimetre in diameter, are strong enough to carry a weight of 3 kilogrammes without breaking, and are very flexible and convenient to handle. They are easily passed into the eye of the needle, tied into knots, and may be used for all kinds of sutures, including continuous sutures.

"The irritation produced by them is so insignificant that they

may, without inconvenience, be left *in situ* for quite a long time, on condition that they have not been drawn too tight. These aluminium-bronze wires are intended mainly for superficial sutures, being unsuitable for buried sutures, especially in regions with a rich nerve supply, as their stiff ends would be apt to give rise to pain in this situation." (*Medical Week*, Vol. V., page 286).

Tannalbin (a compound of Tannin and Albumin, but not so-called Tannin Albuminate) continues to be one of the preferable forms of administering Tannin, and is still found to be markedly serviceable in infantile diarrhea. It appears to have no special advantage over Tannigen, and in fact many practitioners have made little choice between them.

Among others Dr. Traumann, of Nuremberg, Bavaria, has continued to use this agent for some time in all forms of intestinal catarrh (*Münch. Med. Wochensch.*, Vol. 44, page 475).

Dr. G. Scognamiglio, of Naples, Italy, has made use of it in 18 cases of acute and chronic intestinal catarrh and in 7 cases of renal affections (*Wien. Med. Blätter*, Vol. XX., page 25).

Dr. Johann Czernetschka has published a tabular report of 33 cases of different forms of diarrhea in children (*Prag. Med. Wochensch.*, Vol. XXII., pages 296, 309 and 324).

Dr. J. Comby, of Paris, France, has used this agent as well as Tannigen in all infantile diarrheas (*La Méd. Moderne*, Vol. 8, page 473).

Tannigen (Acetyl Tannin)—the odorless and tasteless form of Tannin, insoluble in water and acids, but readily soluble in alkaline solutions—is still in use as quite a valuable agent in diarrhea, chiefly in children. Its continuous use is apparently accomplished without any disagreeable effects. Dr. R. Hirschberg reports on it in the *Revue de Thérap. Méd.-Chirurg.* (Vol. 63, page 618). Dr. J. Vandenberghe relates a typical case of disinfection of the alimentary canal *per os*. In 12 cases of various forms of acute and chronic enteritis he prescribed this agent in doses from 500 milligrammes to 2.5 grammes (7.7 to 38 grains) daily with gratifying results—10 of these were children and 2 adults. The administration of this agent accompanied with proper feeding saved many children in his practice. In some of his cases as many as 20 movements a day were noticed, but after his treatment with this agent the improvement was markedly rapid, resulting in complete recovery.

Dr. J. Comby, of Paris, France, has given this agent a prolonged

trial in the treatment of infantile diarrhea. He seems to have used Tannalbin as well as this agent and his most satisfactory results have been obtained in simple non-infective diarrhea in children. As neither of these agents are intestinal antiseptics he claims they are not adapted to cholera-infantum unless some antiseptic like Calomel be given with them.

Tannoform (the condensation product of Tannin and Formaldehyde) has been little heard of in the current medical literature during the past year.

Tanosal is a new synthetic combination of Tannic Acid and Creosote in the proportion of 2 to 3. It appears as an amorphous dark brown powder, having a slight odor of its creosote element and a harsh taste. It is very hygroscopic and is therefore not generally seen in the above described condition, but is offered either in aqueous solution or in pill form. A solution is usually used containing 600 milligrammes (about 9.4 grains of Tanosal to 15 grammes (a tablespoonful) of water, and 15 grammes of this solution is taken 3 times a day, gradually increased even at times to twice this amount.

Dr. G. Kestner, of Mülhausen, Germany, has employed it in over 75 cases, 33 of pulmonary tuberculosis, 15 of acute bronchitis, 11 of chronic bronchitis, 1 of chronic broncho-pneumonia, 5 of bronchitis accompanying infectious diseases and 10 of simple catarrh of the throat and bronchi. He claims that he obtained his best results in the last 10 cases and that in pulmonary tuberculosis it acts fully as well as any other of the creosote preparations, however disturbing the digestive apparatus far less (*Therap. Wochens.*, Vol. X., page 609).

Tetronal—closely allied to Sulphonal and Trional—is no doubt still being used to some extent, but practically nothing has appeared about it in the medical literature of the past year.

Thioform (so-called Bismuth Di-Thio-Salicylate)—a combination of Bismuth, Sulphur and Salicylic Acid—offered as a substitute for Iodoform, is now apparently used only to a limited extent. Aside from the use the dermatologists make of it, it is being employed as an intestinal antiseptic in 400 milligramme (about 6½ grain) doses 2 or 3 times daily.

Thiol—synthetic Ichthyol—has been practically unnoticed during the past year. The only prominent mention is that of Dr. Wirz, of Kaisersesch, Germany, who states he has made excellent use of it for a year back in place of Ichthyol in many cases. He is convinced

that it is a valuable substitute for Ichthyol, especially as its lack of odor makes it of prime importance when employed about the face (*Therap. Beilage der Deut. Med. Wochensch.*, Vol. XXIII., page 43).

Thiosinamin (Allyl-Sulpho-Carbamide) has still kept to the front in the treatment of lupus. The results of Dr. Hans von Hebra, of Vienna, Austria, have now been confirmed by Dr. Van Hoorn through further clinical and bacteriological researches. There are still those, however, who believe that it is not as efficient as claimed, and even Dr. Van Hoorn only recommends it of value in lupus when applied locally.

Its most marked value, however, appears in its action upon scar tissue. In this line the valuable report of Dr. Sinclair Tousey, of New York City, was alluded to here last year. Now Dr. Richard C. Newton, of Montclair, N. J., has followed up Dr. Tousey's lead, and fully confirms his results. He remarks: "The remedy is yet too new for its proper place in therapeutics to be known, but my own experience, which is limited to two cases, has led me to think very favorably of it." (*N. Y. Med. Journ.*, Vol. LXV., page 380.)

Dr. Newton's results were given at a meeting of the Society of the Alumni of the City Hospital on November 11th last, and the discussion which followed will be found in the *New York Medical Journal* (Vol. LXV., page 397).

Thyroid Extract has lost none of its prominence during the past year, but much careful study has been given to it. The literature on this subject continues to increase very rapidly, and some points have been very definitely established as to its value. The summing up of Dr. R. Lépine, of Lyons, France, last year is practically true to-day, but the most recent and excellent summary of the results up to date is given by Dr. Francis P. Kinnicutt, of New York City, in his article "The Therapeutics of the Internal Secretions" contributed to the discussion upon "Internal Secretions" at the Congress of Physicians and Surgeons, held at Washington, D. C., on May 5th last. He closes with a bibliographical list of references which are of much value to those who desire to study the subject in detail (*Amer. Journ. Med. Sciences*, Vol. CXIV., page 1).

Among the most recent new applications, the following only may be mentioned. Dr. Gabriel Ganthier, of Charolles, France, writes of the use of this agent as a means of consolidation in fractures. He was led to try this treatment in retarded consolidation of fractures by its well recognized effects in disordered nutrition of osseous

tissue. He points out that Professors Haman and Steinlein had noticed, as far back as 1895, that repair was notably delayed and callus was formed in much less amount in dogs with experimental fractures treated with Thyroid Extract than in healthy dogs, and based his experiments on this supposed fact. He relates two cases in which he apparently met with success :

(1) A strong, healthy country girl, aged 15, broke her left leg (*sic*) in the lower third. The fracture was simple, with over-riding of the fragments, which were easily reduced. The limb was put up in plaster-of-paris. Union did not take place, in spite of the administration of phosphate of lime, rubbing of the ends of the fragments, etc. When 110 days had elapsed without consolidation taking place, Gauthier prepared from the thyroids of young sheep a glycerinated juice, a teaspoonful of which represented 1 gramme (about 15 grains) of thyroid substance. Of this the patient took from six to ten teaspoonfuls a day. During the first two or three days she complained of intense headache, flushing of the face, giddiness, and a feeling of suffocation, but a fortnight after the commencement of the treatment the fracture was consolidated, and a month later she could walk about as well as ever. Careful palpation failed to reveal any abnormality in the thyroid gland. The total amount of thyroid substance taken was 120 grammes. (2) A healthy man, aged 48, suffered a fracture of the radius. The limb was put up in plaster. After three months there was no consolidation. Thyroid treatment was begun and continued for between three and four weeks, the total amount of active thyroid substance taken being about 160 grammes. Consolidation was then established. In this case, too, the thyroid gland was, as far as could be made out, perfectly normal. Gauthier, while admitting that two cases are insufficient to prove the value of the treatment, thinks the results in the cases which he records suggestive and encouraging. He adds that whenever thyroid treatment is employed the practitioner will do well, whenever possible, to extract the thyroid himself instead of leaving it to the butcher to do so. Young sheep should be chosen for the purpose. That animal has two thyroids; hence two incisions should be made, one on each side of the trachea. If a median incision is made, especially in a very young animal, the operator is likely to take the thymus instead of the thyroid. (*Lyon Méd.*, Vol. LXXXV., pages 296 and 359.)

Dr. R. R. Stawell, of Melbourne, Victoria, has published his notes

of 7 out of 9 cases in which the administration of this Extract acted efficiently as a galactagogue, increasing both the flow and quality of the milk. He remarks :

“ While very fully alive to the danger of making generalizations based on only a few clinical observations, it seems to me that there is sufficient evidence that thyroid extract is an apparent galactagogue in certain cases.” (*Inter-Colonial Med. Journ.* of Australasia, Vol. II., page 177.)

Thyro-Iodin—the name given to the compound which has recently been isolated by Prof. G. Baumann, of Freiburg, Germany, from the thyroid gland of the sheep—has not been alluded to under this head to practically any extent throughout the past year. Previous notices have been repeated from time to time, but no new matter has been noticed. Possibly the work has all been classed under Thyroid Extract.

Toxins (meaning all the morbid substances produced by living beings) have gradually become quite a study by themselves. Dr. H. Hallopeau, of Paris, France, read a paper before the Twelfth International Medical Congress in Moscow, Russia, on Toxins in Dermatology. He claims that the essential condition of the production of toxins is cellular activity ; to each cellular action belonged the genesis of products that were characteristic of it, and might remain incorporated with the anatomical elements, become accumulated in the ambient tissue, penetrate the lymphatic circulation or that of the blood, and become primarily or secondarily eliminated with the products of secretion ; whence the possible appearance of morbid symptoms, either in a limited territory of the external integument, on various parts of its surface, or in its totality. It might become developed in subjects who generated toxins or in other living beings to whom the noxious product was transmitted. The subject of toxins was a very vast one, since it comprised not only all the venoms or poisons, but also all the products of secretion and of assimilation of living organisms and of the parasites which multiplied in them ; besides, the tissues and especially the normal liquids of each living species might become noxious to other species.

Dr. A. Gautier, in studying these products from a chemical and biological point of view, had divided them into three principal classes : Lencomaines, ptomaines, and toxins properly so-called. We must take into consideration, he said, in the pathogenic interpretation of the toxins, not only the nature of the agent, but also that of

the material presented by the affected subject by reason of his constitution, of his age, and of the conditions in which he happened to be at the time he was exposed to the noxious action. The toxins might be exogenous, endogenous, or of mixed origin.

The exogenous toxins comprised the venoms, the poisons, and the liquids and tissues of other animal species. Their action was exercised near the place of entrance under the form of erythema, vesication, suppuration, urticaria, purpura, more rarely gangrene, sometimes dyschromia, such as that which characterized the action of the pediculi pubis, and abnormal sensations, more frequently pruriginous or burning; it might make itself felt from a distance, or become generalized over the entire cutaneous surface.

The endogenous toxins might proceed from troubles in the cellular functions or from absorption of the products of normal or altered secretion. The products of cellular function might become noxious either from their excessive quantity or by their alteration, under the influence sometimes of an hereditary or acquired predisposition, sometimes from a transitory or lasting alteration of the internal medium which constituted the humor; this alteration might be itself of exterior origin, accidental, or provoked by a trouble in some function of the organism.

“Among the products of visceral origin which might give rise to cutaneous alterations were thyroïdin and the substances which accumulated when the thyroïd body was destroyed, the secretion of the suprarenal capsules, the abnormal substances that were engendered during the menstrual period, etc. The products of secretion of which overabundance, alteration, or insufficient elimination was the cause of poisoning included, especially, bile, glucose, and the materials of the urinary and sudoral secretions. Tommasoli, said Dr. Hallopeau, had demonstrated the influence of the auto-toxins on the genesis of the hyperkeratoses.

“Regarding toxins of mixed origin, those that engendered the microbes introduced into the organism should be considered as such, for, if the agent which produced them came directly or indirectly from outside, it engendered them with the aid of elements found in the cells or in the liquids of the organism. The fact, said Dr. Hallopeau, was very evident in the fermentations of the digestive tract, that was incessantly invaded by numerous microbial colonies which secreted there toxins at the expense either of nutrition or of the products of secretion. The organism was protected against them

especially by the epithelium and by the liver. The mouth was frequently the seat of infectious absorption, and this was a cause of cutaneous alterations in pyrexia. The absorption of the toxic products elaborated in the dilated stomach was the cause of acne, of eczema, and of urticaria; the rose spots of typhoid fever were due to the action of toxins developed in the intestine.

"The mode of action of certain toxins might be very diverse. That of tuberculosis might remain localized around the microbial centers and give rise either to anatomical tubercle or to other isolated and limited neoplasms which might spread from one place to another, and might provoke at a distance various other manifestations of tuberculosis, such as Barthélemy's follicles, the so-called acne cachecticorum, and acne scrofulosorum, inflammation of the solitary or agminated glands, complicated or not with pemphigoid eruptions, and persistent papulo-erythematous eruptions. The pseudo-exanthematic manifestations of erythematous lupus should also be interpreted in the same sense; and it was probably the same of the acute erythematous eruptions which were observed in glanders, leprosy, and mycosis, the toxins intervening, in all probability, in the genesis of eczema, psoriasis, purpura, and pemphigoid eruptions that were not trophoneurotic. Dr. Hallopeau concluded by stating that the toxins exercised a great influence in the genesis of skin diseases, but that it remained to determine the exact chemical constitution of each one of them." (*N. Y. Med. Journ.*, Vol. LXVI., page 609.)

The use of the toxins in the treatment of malignant growths has been carried on in Prof. Czerny's clinic in Heidelberg, Germany.

"27 cases were treated according to the method of Coley. Of these 27 cases 10 were carcinomata, and 17 sarcomata (7 round-cell, 3 spindle-cell, 3 lympho-, 2 angio-, 1 osteo-, and 1 melano-). The following deductions were drawn: 1. In carcinomata the results were completely valueless. 2. In sarcomata, only very exceptional cases showed any result. 3. This questionable advantage was equalized by the dangers of poisoning as well as by the increase of the tumors in other cases.—XXV. German Surgical Congress." (*N. Y. Med. Record*, Vol. 52, page 207.)

At a meeting of the Paris Biological Society held on July 24th last, Dr. A. Charrin exhibited an experimental double monster produced by the injection of Toxins into the mother. He presented 2 guinea-pigs, one white and the other yellow, which apparently

were growing together at about the middle of the bodies. They had three ears, one of which was double and eight limbs, two being on the back. The x-Rays showed as is usual in such cases perfect symmetry, and all parts of the body were seen to be double below the skull. Dr. Charrin stated that he had been carrying on this line of investigation for some 8 years past, producing quite a variety of anomalies, such as harelip, club-foot, dwarfism, etc. He, however, very rightly does not feel justified from his past experience in asserting that there exists any necessary relationship of cause and effect between these anomalies and the Toxins injected (*Comptes Rendus hebdom. de Séances de la Société de Biologie*, Vol. IV., page 770).

Trional (Di-Ethyl-Sulphon-Methyl-Ethyl-Methane) — closely allied to Sulphonal—is rapidly replacing Sulphonal, the Bromides and Chloral Hydrate, especially in this country and in France. Those who have used it longest claim it to be safer, more rapid, more lasting and deeper in its hypnotic effects than the whole list of other agents. It acts promptly in much smaller doses and often succeeds when all the others have failed. One of the most enthusiastic practitioners reporting during the past year is Mr. J. Arthur Browne, of Guilford Street, London, W. C., England, who has published “A Note on Trional” (*Brit. Med. Journ.*, Vol. I. for 1897, page 782) as follows :

“A safe, efficient, and easily administered hypnotic is a distinct addition to our armamentarium, and as fulfilling these conditions, the result of a six months’ constant use of trional may be of interest.

“I have given it to produce sleep in cases of pneumonia, bronchitis, alcoholism with delirium, insomnia from mental worry, and other forms of nervous insomnia, and I have invariably found it satisfactory. It is rapid in its action, and it has these advantages over sulphonal or the bromides, that it is more certain and does not produce the disagreeable sequelæ of sleepiness, lassitude, and depression on the day following its exhibition. Nor have I observed any derangement of the digestive system in connection with its administration. An initial dose, gr. xx or xxiv, may usually be reduced to xv or less, and in this way trional becomes invaluable for breaking a pernicious habit of sleeplessness, where a few good refreshing nights may restore the normal habit of sleep. Even in cases of confirmed insomnia, which have been treated unsuccessful-

fully by chloral, paraldehyde, and the whole gamut of hypnotics, each drug having in turn to be increased in dose until it finally loses all power or becomes dangerous, trional in my hands has afforded marked relief without apparently any ill-effect, and has given tranquil refreshing sleep without any increase of the initial dose.

“One patient, a retired navy surgeon, a museum of complaints—mitral insufficiency, gout, eczema, albuminuria, and marked emphysema—who has had every known hypnotic for his obstinate insomnia, has been taking by my advice trional 15 to 20 grains for the last five months almost every night. He has never had to increase the dose, and I have never detected anything but a good result from his continued use of the drug. I am confident that his heart has much benefited by the regular sleep, and his nocturnal attacks of dyspnoea are now unknown. I find trional is easily taken in cachets or suspended in hot milk or water.”

The chief drawback to this agent is the urobilinuria occasionally caused by it—at times it becomes excessive, but rarely so.

Dr. L. Kämpfer, of Werneuchen, Germany, reports (*Therap. Monatsh.*, Vol. XL., page 122) that sometimes cerebral excitement, instead of sleep, will be induced. It was noticed especially with cancer patients of an advanced stage.

Poisoning cases are still recorded, and the precaution is again urged that whenever Trional is being given for a prolonged period an occasional interruption in its administration for a day or two or of rapidly reducing the dose is advisable, until there is a temporary or complete elimination of it from the system.

Triphenin—the name given to one of the newer antipyretics, analogous to Phenacetin—has not been heard of in the current medical literature of the past year, and possibly has passed permanently out of notice.

Tuberculin (Parataloid) was continuing on its beneficial course as a diagnostic agent of value, even though there were a few dissenting observers, when Koeh's new compound was announced, which practically monopolized the attention of all interested observers. So much has been written on this one point of the diagnostic value, particularly of the now older Tuberculin that only a few prominent references can be given here for those who would study the subject in detail.

Dr. Sandberg, of Bergen, Norway, writes (*Brit. Med. Journ.*,

Vol. II. for 1896, page 1108) of this agent in surgical diagnosis, and gives the clinical results only of 13 cases. He concludes: "If we now summarize the results of the treatment with tuberculin in these cases, it is at once clear that tuberculin is a reliable diagnostic agent in surgical tuberculosis, but with regard to this there has been heretofore no difference of opinion. The dispute has been regarding the therapeutic value of the remedy. My opinion is that in my cases the results obtained might equally well have been obtained by any other mode of treatment. I dare not in any special case blame the tuberculin for the bad result, as the patient who now feels best was the one injected with the greatest quantity, in all about 130 mg.; he looks remarkably well and is quite stout. I do not, as said before, attribute this to the tuberculin, but think it proves that the remedy need not necessarily have any injurious effects, either locally or generally. But in my opinion its therapeutic value in the tuberculous diseases of the joint is proved. As, however, it cannot be proved to possess any curative power in the treatment of tuberculous joint diseases, it ought to be struck out as worthless. As an exception it might in certain other cases of local tuberculosis, such as the one instance of epididymitis mentioned above, have some significance in a therapeutic respect, otherwise its value is only as a diagnostic."

At the Annual Meeting of the British Medical Association, held in Montreal, Canada, last September, Dr. James T. Whittaker, of Cincinnati, Ohio, read a paper before the Section of Medicine on "Generalizations from Six Years' Use of Tuberculin" (*Brit. Med. Journ.*, Vol. II. for 1897, page 1053). He concludes: "the treatment must be persistent, and good judgment must be used in dosage. Rather too little than too much. I have never seen any bad results from the use of tuberculin, because I have always endeavored to secure a slow tolerance, so that individuals who react at first to a few milligrammes become later insensitive to one hundred times as much; in fact, at last to 1,000 milligrammes. The evils ascribed to it I believe to be due to the disease itself, for I have seen them as often before the use of it. But it is easy to conceive that the patient would suffer under excessive reactions, and that repeated excesses might do permanent harm. But *ex abusu non arguitur ad usum*. It is a maxim of the law, good also in medicine, that we may not from abuse argue against use.

"The highest value of tuberculin is the diagnostic value, which

is supreme, and which enables us to distinguish the disease at the start, as a tuberculosis, before the development of sepsis or other complications which go to make up that composite picture which we call phthisis."

Dr. A. Chauffard, of Paris, France, writes (*The Medical Week*, Vol. V., page 63) on "Simple Pneumothorax and its Diagnosis by Tuberculin," in which he relates at some length his mode of proceeding in the treatment of one case. He concludes:

"As far as I am aware, this is the first time that this method of diagnosis has been resorted to under such circumstances. The result is a degree of certainty which is not obtainable otherwise. Some of the cases collected by Galliard even appear to me doubtful, and when I find cases of this affection complicated by serous or septic effusion, or by dry pleurisy, that is to say, phenomena due to infection, I am loth to believe that there is merely rupture of an emphysematous lobule, without any infective lesion of the pleura.

"Be this as it may, the case to which I have called your attention is instructive both from a theoretic and practical point of view."

"There should be no hesitation, therefore, in certain well-defined cases, in endeavoring by the use of tuberculin to arrive at a degree of certainty in respect of the diagnosis, which is not obtainable by other methods at our disposal. A clinician indeed cannot afford not to utilize the advantages accruing from laboratory experiments."

Dr. J. M. C. Mouton, of Leyden, Holland, claims that this agent is not such a valuable one for diagnostic purposes in human tuberculosis, although undoubtedly so in that affection as observed in cattle. He relates the details of having injected 12 patients with this agent, varying the dose between $\frac{1}{2}$ to 1 milligramme ($\frac{1}{128}$ to $\frac{1}{64}$ of a grain). In one case only he gave as large a dose as 3 milligrammes (about $\frac{1}{5}$ of a grain). In 7 cases he noticed a reaction, but he gives the details of the whole 12 cases and discusses the questions as to how much Tuberculin should be employed, the rise of temperature to be looked for as constituting a reaction, the question whether non-tuberculous patients present a reaction, and whether tuberculous patients give no reaction, and lastly whether there is any danger in such injections (*Münch. Med. Wochens.*, Vol. 44, page 579).

Dr. Theodor Kasperek has published his results in an important series of investigations on healthy and tuberculous cattle. He

made use, in a comparative way, of human and bird Tuberculin. He found that it required 8 times the quantity of bird Tuberculin to produce the same effect in an experimental guinea-pig as a given dose of the human product. Naturally he found that much depended on the body weight of the animal. After taking these precautions he appears to have demonstrated that the Tuberculin reaction was constant in diseased as distinguished from non-tuberculous animals. His investigations will be interesting to those who desire to follow up the subject (*Wien. klin. Wochensch.*, Vol. X., page 623).

Mr. James W. Wilson, of Aberdeen, Scotland, has published a small pamphlet on "Results of the Use of Tuberculin" with 3 temperature charts, giving a description of the attempts to eradicate tuberculosis by means of this agent (*Brit. Med. Journ.*, Vol. I. for 1897, page 421).

The following resolution was passed at a meeting of the Brighton and Sussex Medico-Chirurgical Society of England in April last, which it might be well to imitate in this country :

"That preference, in the opinion of this Society, should be given in obtaining milk supplies to such farmers and dairymen as guarantee that their cows have been properly subjected to, and have failed to react to, the tuberculin test for tuberculosis."

"It was subsequently decided to send a copy of this resolution to the local press and to the local governing bodies. The resolution appears to us one that might well be passed by every medical society throughout the country. Apart from any immediate practical effect it will have a wide educational influence, which is certain in the future to bear fruit. The more attention is drawn to the immense value of tuberculin as a means of detecting bovine tuberculosis the better for the public, and indirectly for both butchers and farmers. Butchers can, by insisting on a warranty, protect themselves against the possible confiscation following the slaughter of diseased animals; and farmers, when brought face to face with the practical problem, will find that it is to their advantage to apply the test to their cattle, to carefully isolate the reacting animals, and to disinfect and limewash the stalls which they have left. By these means there is every reason to hope for a great diminution of bovine tuberculosis in this country; and it is not unreasonable to expect along with this a reduction in *tabes mesenterica*, etc., among children and invalids. We understand that in Brighton one enterprising dairy already advertises the fact that all cows from which its milk is supplied

are guaranteed free from tuberculosis as proved by the tuberculin test. This is a matter of great importance to doctors who have to order milk for delicate persons and for children ; and it may be hoped that other dairymen will speedily follow suit." (*Brit. Med. Journ.*, Vol. I. for 1897, page 993.)

As to the work accomplished in this country on this diagnostic line, only one reference will suffice here although many might be given. Dr. E. L. Trudeau, of Saranac Lake, N. Y., has written an article on "The Tuberculin Test in Incipient and Suspected Pulmonary Tuberculosis," in which he remarks :

"The importance of making an early diagnosis in case of tuberculosis cannot be too strongly emphasized. While studies in the antopsy-room have shown how often incipient tuberculosis is healed in man without its presence having even been suspected, clinical observation teaches daily how powerless we are to deal with the disease in its advanced stages, and how a latent pulmonary tuberculosis may be transformed into a hopeless and rapidly fatal disease when the unrecognized tuberculous process has gone on to ulceration, and when secondary infection has supervened. . . .

"No evidence in connection with the tuberculin test as applied to man and animals has been forthcoming thus far from those who have made use of it which would tend to sustain the general impression that this method is necessarily dangerous and tends invariably to aggravate the disease, and my own experience has developed nothing which would seem to confirm this impression." (*The Medical News*, Vol. LXX., page 687.)

Owing to a typographical error discovered later, Dr. Trudeau wrote to correct as follows :

"I am made through a typographic error to say 'The first injection should not exceed five milligrams,' whereas the text should read 'The first injection should not exceed five-tenths of a milligram.'

"As the use of a small initial dose is an essential feature of the method I have employed, and as the injection of so large an initial dose as five milligrams might result in producing very unpleasant symptoms, may I ask you to correct in your next issue this unfortunate mistake ?

"In order to make the matter plain, allow me also to repeat the following sentence from the original article : 'The adoption of an initial dose so small as to guard against the possibility of producing

violent reactionary symptoms, and a graded increase of subsequent doses within such quantities as are known never to produce reaction in healthy individuals would seem to afford the best protection against unpleasant results and misleading evidence.'” (*The Medical News*, Vol. LXX., page 748.)

In regard to the New Tuberculin preparations of Prof. Robert Koch, of Berlin, Prussia, most American practitioners have already become familiar with the comments of their domestic brethren, therefore it may be profitable to confine these comments here to some of the expressions offered by foreign observers. For the benefit of those who may desire to study this subject systematically it may be of service to have a record that Prof. Koch's original announcement is to be found in *The Deut. Med. Wochensch.*, Vol. 23, page 209. Copied in French, it will be found in *La Semaine Médicale*, Vol. 17, page 117. Again, in English it appears in *The Medical Week*, Vol. V., page 169.

Prof. Hans Buchner, of Munich, Bavaria, has published (*Münch. Med. Wochensch.*, Vol. 44, page 299) a very interesting discussion on this new preparation of Koch in which he expresses great hope for its future.

Dr. Campana, of Italy, reports that his experience leads him to conclude that if gradually applied this agent is never harmful and that it is of marked benefit in long-standing cases of lupus and tuberculous infiltrations. He makes a point of the necessity of getting rid of any septic condition found to be present. He finds the thermo-cautery necessary to destroy any nodules whenever they make their appearance. If external developments of tubercle appear he advises Tuberculin as well as surgical treatment.

Dr. Bussenius, of Berlin, Prussia, reports (*Deut. Med. Wochensch.*, Vol. 23, page 441) on 19 cases in which this new agent was used, 4 of lupus, 12 of laryngeal tuberculosis, 2 of uncomplicated pulmonary tuberculosis and 1 of asthma. His results were very encouraging and he proposes to push his trials further.

At a meeting of the Berlin Dermatological Society held in July last Prof. Lassar demonstrated 5 cases of lupus treated with the New Tuberculin in accordance with Prof. Koch's directions. He could not go so far as to state that the question of “cure” was accomplished, but surely the new agent had a favorable influence on lupus without disturbing the general conditions. Its action was irregular, however, and time must elapse before any definite report can be made. He deplored the high price asked for it at this time.

Dr. F. Schultze, of Bonn, Prussia, states (*Deut. Med. Wochensch.*, Vol. 23, page 445) that the time has been too short yet to give any definite conclusions as to its value. He employed it in 9 cases. He was pleased to report that there were none of those ill-effects such as were noticed even when small doses were given of the old form of Tuberculin. In 1 case an apparent tuberculous laryngitis made its appearance during treatment and caused a discontinuance of the treatment on account of the patient's nutrition. In another case intestinal disturbance developed so that the treatment was discontinued in this case also. No noted change was observed in 4 other cases. Again, a dry pleurisy as well as the general condition improved in another case. In the remaining 2 cases there was evident improvement—one of them after developing a laryngeal perichondritis markedly improved.

Drs. Malcolm Morris and Arthur Whitfield, of St. Mary's Hospital, London, England, have published a preliminary note on "Six Cases of Lupus Vulgaris Treated by Koch's New Tuberculin," concluding as follows: "We may say in conclusion that, without committing ourselves to a definite judgment as to the value of this new remedy, we should have no hesitation in recommending it in any case of lupus vulgaris in which the constitution is not hopelessly broken down. In recommending it, we should be careful to warn the patient that he must not look for any miraculous effect. It is clear that a sufficient length of time must be allowed for the operation of the remedy if it is to be effectual; how long that may be it is impossible to say at present. As regards the production of the immunity aimed at by Koch, that is obviously a very difficult matter to test in the human subject.

"Finally, we may be allowed to express the hope that the new tuberculin may soon be made more easy to procure, and less costly than it is at present." (*Brit. Med. Journ.*, Vol. II. for 1897, page 207.)

Dr. Doutrelepont, of Bonn, Prussia, has treated 15 cases of lupus—12 in his clinic and 3 as out-patients. He soon found it desirable to increase the dose more gradually than stated by Koch. He noticed a rise in the temperature and other symptoms occurring when very small doses comparatively were given. He never repeated his injections until the temperature was brought down to normal. In 7 of his cases a very marked reaction was obtained after the injection. He preferred to add 20 per cent. of Glycerin in place of

the Saline Solution in those cases. He verifies the observation of others that the age of the Tuberculin is apparently of importance in causing the noticed rise in temperature (*Deut. Med. Wochensch.*, Vol. 23, page 537).

Prof. Juan L. Mohr, of Cadiz, Spain, reports on 4 cases treated with this new agent, and his conclusions are that the New Tuberculin even in the highest degree of dilution, always causes reaction, though the intensity may vary. Koch's statement cannot, he thinks, be reconciled with clinical facts, and he considers this new agent "impossible" as a therapeutic agent (*Epitome of Brit. Med. Journ.*, Vol. II. for 1897, page 31).

Dr. Slawyk, of Berlin, Prussia, has made 50 injections in the clinic of Dr. Heubner. He gives full details of his first 2 cases only and states that no certain conclusions can be drawn as to the value of this agent, for the time is yet too short (*Deut. Med. Wochensch.*, Vol. 23, page 473).

Dr. W. Wörner, of Berlin, Prussia, has treated 8 cases—4 of lupus, 1 of scrofuloderma with pelvic abscess and 3 of early pulmonary tuberculosis. In one of his cases of lupus marked improvement was observed. In 2 others which he had scraped before the agent was injected showed no recurrence. In the case of scrofuloderma, prompt cleaning off and even healing of the ulcers was accomplished although these ulcers were of long standing. Practically no effect whatever was observed in the cases of pulmonary tuberculosis. However Dr. Wörner feels encouraged to extend his trials further in small doses (*Deut. Med. Wochensch.*, Vol. 23, page 476).

Dr. L. Seeligmann, of Hamburg, Germany, reports one case of tuberculosis of the skin and generative organs with favorable results (*Deut. Med. Wochensch.*, Vol. 23, page 476).

Dr. F. M. Sandwith, of Cairo, Egypt, records 2 cases of pulmonary tuberculosis with the following conclusions: "If all lung cases react as easily as mine, the injections might be used as a method of diagnosis more delicate and less dangerous than the old tuberculin. At present one is a little shy of a remedy which is to be increased in dosage from $\frac{1}{5000}$ milligramme to 20 milligrammes—i. e., the minimum dose is 10,000 times smaller than the maximum. To become popular the new remedy must be made easy to obtain, less costly, and must be diluted in a less cumbersome way, if 'the dilution is always to be prepared at the time it be used.' The tuberculin itself is painless, but the glycerine in the solution causes a little stinging." (*London Lancet*, Vol. II. for 1897, page 600.)

Mr. Frederic Eve, of London, England, reports on 8 cases of surgical tuberculosis and states: "My own personal impressions of the results of the new remedy may be summed up as follows: Some slight although no markedly favorable influence may be exerted in cases of early tuberculosis of joints or in those in which no evidence of softening of caseous material exists. But the effect where caseous material has broken down, and especially if the disease has become septic, is negative. The subsequent course of the cases described below will be carefully watched.

"It cannot be said that the new remedy is altogether free from the drawbacks possessed by the old tuberculin of producing pyrexia and constitutional disturbance. In nearly every case a considerable rise of temperature occurred after one or two milligramme doses had been reached, and sometimes before. After this the duplication of successive doses, recommended by Koeh, had to be given up for a more gradual increase. The pyrexia in some case was very great, amounting to a rise of 7°F. Other unpleasant symptoms follow the administration of larger doses, such as vomiting, malaise, headache, and prostration. No local reaction was observed. In several instances abscesses formed at the seat of injection, although strict antiseptic precautions were enjoined. The number of these may in a measure be explained by the fact that during the progress of the trial we had several changes of resident officers." (London *Lancet*, Vol. II. for 1897, page 704).

Other observers criticize quite severely the action of this new agent and rehearse the same drawbacks alluded to by some of the above, but not a few of an opposing nationality take this opportunity to throw discredit on Koeh's work and attempt to minimize the good points in their anxiety to show up the weak ones. This surely is not a true scientific spirit and simply reacts in the end on the ill-natured dissenters.

Dr. Jos. O. Hirschfelder, of San Francisco, Cal., has published in the *Occidental Med. Times* of Sacramento, Cal. (Vol. X., pages 682 and 731) a still further modification of this agent which he calls "Oxytuberculin" on the theory that recovery from tuberculosis depends essentially on an oxidation process. He treats Tuberculin with Hydrogen Dioxide, and administers this modification in very large doses. He finds that the most suitable cases for treatment are those in which cavities have not yet formed, and especially those of laryngeal tuberculosis, where the improvement may be directly observed

with the laryngoscope. A tuberculous ulcer on the back of a medical man's hand healed in a short time under the local application of oxy-tuberculin, after all other remedies had proved useless. Dr. Hirschfelder gives a detailed account of eight cases of pulmonary tuberculosis where the bacilli disappeared and the patient's general health improved in the course of the treatment. He states that he has also cured cases in a more advanced stage and promises to publish his results at some future time, the object of the present communication being only to demonstrate that the antitoxin is practically an oxidized toxin. According to him, pneumonia, empyema, and streptococcus infection are also capable of being treated by their respective oxy-toxins, and the same is probably the case in all infectious diseases. He has also made experiments with carcinoma, but the number of cases is too small to, as yet, justify a definite expression of opinion.

Drs. E. L. Trudeau and E. R. Baldwin, of Saranac Lake, N. Y., have made an appeal for "The Need of an Improved Technic in the Manufacture of Koch's 'T. R.' Tuberculin" (*The Medical News*, Vol. LXXI., page 257):

"During the past three months we have been able to repeat at the Saranac Laboratory Koch's recently published method relating to the immunizing fluid, and to carry through several times, with our own virulent cultures, the processes of manufacture; following closely the rather meager details given by its inventor." . . .

"Without any personal or more general experience, however, of the ultimate immunizing effects of this method, it would seem that unless by repeated centrifugation or some other means we can rid the new tuberculin entirely of living tubercle bacilli, we are hardly warranted in applying it as yet to the treatment of human beings."

Tussol (Antipyrin Mandelate)—containing about 55 per cent. of Antipyrin—has been practically unheard of during the past year. A few comments have appeared, but they will be found to be repetitions of last year's reports.

Uranium Nitrate has received little attention during the past year—in fact practically the only mention aside from what was alluded to here last year is a paper by Dr. Ebenezer Duncan, of Glasgow, Scotland, on "The Treatment of Diabetes Mellitus by Nitrate of Uranium," read before the Section of Medicine of the British Medical Association at its meeting in Montreal, Canada, in September last. He gives the clinical history of 5 cases with charts and

concludes : “ After careful consideration of all the facts of these cases, I have formed the opinion that the diminution of the urine and of the sugar in these cases, and the improvement in the weight and in the general health and strength of these patients is due to a stimulating effect produced by the uranium salt on the sugar-consuming cells of the human body. This effect may be either direct or indirect through trophic nerve centres. The sugar formed from the food of the patient is no longer excreted, and as the patient gains in weight and muscular strength it must have been consumed in adding to the nutrition of the tissues. It is true that by physiological experiments it has been proved that outside of the human body the uranium salt retards the digestion of starch, and forms an insoluble compound with albumen, and on that ground Dr. West thought it likely that its action in diabetes is due to the effect it has in checking the rapid digestion of starch, and of some forms of albumen. The difficulties I have in accepting that theory are, first, that my patients appeared to digest their food quite normally, and even rapidly, as shown by the frequent meals they asked for ; and in the second place, the large amount of sugar of milk taken in these cases would ultimately have overflowed into the urine if it had not been taken up by the sugar-consuming cells. I am of opinion that the cases in which this remedy will prove most useful are those of neurogenous origin, and, therefore, it may form a useful test in the differential diagnosis between neurogenous and pancreatic and other forms of diabetes. In the latter class of cases I do not think it will be of any value.” (*Brit. Med. Journ.*, Vol. II. for 1897, page 1044.)

In the discussion which followed Dr. James Tyson, of Philadelphia, Pa., “ said that almost 20 years ago he first used nitrate of uranium in the smaller doses recommended at that day, not exceeding 2 grains three times a day. Then he met Dr. West’s paper, and was much impressed with it, and immediately placed several cases upon the drug. After what seemed to him a fair trial he had discontinued it as failing of its purpose. He had not, however, been able to increase the dose beyond 5 grains three times a day, because of its producing looseness of the bowels. He noted that Dr. Duncan reached a dose of 15 grains three times a day. In one bad case attended by stubborn constipation he had given it without producing the effect he hoped for, namely, the relief of constipation. This case subsequently died.

“ Dr. Sandby apologized for having been absent during the

reading of the paper, but he might be permitted to say that he, too, thought he had satisfied himself 17 or 18 years ago of the uselessness of uranium nitrate, but the remarkable paper of Dr. West led him to reconsider the question, and he had placed a large number of patients on this remedy in doses extending up to 30 grains daily. As a result of this experience he regretted to have to conclude that in uranium nitrate we have no specific for the treatment of diabetes."

Urotropin (Hexa Methylene-Tetramin)—formed by the union of Formalin and Ammonia—has received little attention during the year except from its introducer, Dr. Arthur Nicolaier, of Göttingen, Prussia, who no doubt desires to add any testimony as to its value which he can bring by his continued use of it.

Weights and Measures by the Decimal (Metric) System has made good progress during the past year, for not only does the already proclaimed edict render the adoption of the system in Russia sure after the stipulated date, but its permissive use in Great Britain is now practically accomplished. There are of course quite a number in England, who still object to any change, and some even propose "to combine the best features of the two systems," without at all appreciating the fact that such a hotch-potch and confusion would be produced that it would be far better to simply defer any further action whatever until the complete change could be accomplished. But the report has already been made that the bill legalizing the system in Great Britain has now passed both houses of Parliament and only awaits Royal assent.

Scientists, chemists and pharmacists have repeatedly acknowledged the benefits to them of the use of this system, but now even the surgical profession is recognizing the fact, for the Council of the Royal College of Surgeons in Ireland have resolved in future to require examination candidates to make calculations in chemistry, pharmacy and therapeutics in metric terms.

It is interesting to note that the State Department at Washington, D. C., has received from Bluefields, a town of the Mosquito Territory, Nicaragua, an official statement to the effect that invoices of goods for that port will not be received by the authorities unless made out in the metric system of weights and measures.

Xeroform—another substitute for Iodoform—is a compound of nearly equal proportions of Tri-Bromo-Phenol and Bismuth Oxide, producing chemically Tribromophenol Bismuth. It is presented in

a form not unlike Iodoform, of a fine yellow, nearly odorless (odor like Iodoform but less pronounced), practically tasteless, non-irritating, non-toxic powder. It is reported to have powerful germicidal properties, is not affected by exposure to the air or light and may be sterilized. It has been described by some of its enthusiasts as "the Iodoform of the future," having obtained gratifying results in gynecological practice and skin affections.

Dr. Theodor Beyer, of Vienna, Austria, has written upon its use in minor surgery. He recommends further trial.

Dr. Charles Greene Cumston, of Boston, Mass., has published a note on its efficiency as a surgical antiseptic and remarks :

"In closing this short note I would strongly recommend this substance to the profession as a safe and sure antiseptic, and in many respects superior to iodoform or other powders of this class." (*Boston Med. & Surg. Journ.*, Vol. CXXXVI., page 37).

Dr. Josef Grünfeld, of Vienna, Austria, also writes at some length on its use in surgery, relating the condensed clinical history of many of his cases.

Dr. Hngo Fink, of Vienna, Austria, relates his continuous experience for almost six months with this agent in place of Iodoform, always obtaining gratifying results. (*Wien. klin. Rundschau*, Vol. XI., page 331).

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BRIEF COMMENTS ON THE MATERIA MEDICA,
PHARMACY AND THERAPEUTICS OF THE
YEAR ENDING OCTOBER 1, 1898.

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ALPHABETICALLY ARRANGED.

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The apparently never-ceasing mill continues to grind out new synthetic and other remedial agents, resulting in a very decided overproduction and a supply far exceeding the demand. The chief source of the large proportion of these agents is Germany, where a special chemical industry appears to have grown up for this very purpose. Young chemists are engaged, at little or no salary, in this form of investigation continuously, and apparently there are few restrictions to completing such work. They are given all the facilities to experiment with their products upon both animals and human beings, quite regardless of the final results. There may be certain workers who are aiming at very definite, looked-for results, but, in working for that one object, undoubtedly many products are produced which although necessary stepping stones to such an end, are placed upon the market "to see whether they will go." The

great majority of such remedies possess either antiseptic, antipyretic or analgesic properties, and they are produced so rapidly that little time is given to experiment with them physiologically and clinically before a new crop is turned out with more attractive claims. Therefore it is well to bear in mind that in attempting Comments of this kind only those articles can be selected which deserve any attention at all at this time.

Acetanilid (Antifebrin) has been little commented upon specially throughout the past year although all practitioners are fully aware of its very extensive and effective use. Little special comment is therefore called for here, but the report on "Unusual Symptoms Following the Administration of Antifebrin" by Dr. P. V. Ballou of Rowena, Ky. may be of interest to some.

"On September 13, 1897, about noon, I was called to see Mr. B. C., aged forty-five, weight 160 pounds, laborer, with a previous history of no practical interest, he having suffered only from the diseases peculiar to children.

Four days previous, on awakening in the morning, he complained of being uncomfortable and uneasy, with slight nausea, and slight headache; his breath was fetid, and he was noticed to yawn a number of times. This state of affairs continued about one hour, when his bones began aching, the pain gradually growing more severe. This was finally followed by chilly sensations up the back, and a little later the whole body felt cold. This continued for about one and one-half hours, and was followed by fever lasting four or five hours, and ending in a rather copious sweat, which gave great relief. During the remainder of the day the patient felt reasonably comfortable. This condition of affairs was repeated the three following days, with scarcely any change as to time or severity, save that during the afternoon of each succeeding day the patient felt weaker.

When I saw the man, on the fourth day, the cold stage had passed and he was suffering from the effects of fever. An examination revealed a slight bronzing of the skin, an enlarged, flabby, whitish-coated tongue, with edges indented from pressure against the teeth; the pulse, 120; respirations, 23; temperature, 104.8° F. The patient complained of an almost unbearable headache and was beginning to sweat, as evidenced by slight moisture of the skin and a few drops standing on the forehead.

Cold applications being refused, 10 grains of antifebrin was given. About twenty minutes after the drug was given the patient said that

his headache was relieved and that he felt easier than at any time since the previous evening. About forty-five minutes after the drug was administered, all sweating ceased and a peculiar sensation of warmth under the skin was complained of. To this, in twelve or fifteen minutes, was added intense itching, while in three or four more minutes the whole body presented a general erythematous condition. The entire surface was of a brighter red than that of a typical case of scarlet fever, and like the scarlatinal rash it disappeared on pressure, to return as soon as pressure was removed. No part of the body was exempt from this rash, the conjunctivæ, palms of the hands, and soles of the feet being as red as any part of the body. The temperature of the surface seemed elevated, but the thermometer in the mouth showed that it was gradually falling. The body appeared as if every superficial capillary was dilated, and an increased quantity of blood was rapidly flowing through each.

With the appearance of the rash the itching became more intense, the patient assuming all positions possible while scratching. Within the external ear the itching was especially intense, but there was no disturbance of hearing. This condition of affairs, so far as the rash was concerned, lasted for six hours without any apparent change. It then rapidly disappeared simultaneously from all parts of the body, requiring about one-half hour in fading away. As the rash faded, the itching abated, and when entirely gone the itching ceased. The sensation of subcutaneous warmth persisted about forty minutes after these had ceased, and then gradually disappeared. Nothing remained on the surface after the rash had disappeared but a few scratch marks to show that it had so recently been the seat of so great a change.

The pupils were unaffected. Respirations were uninfluenced save by the exertion required in scratching. The heart's action was uninfluenced until about thirty minutes before the rash disappeared, when it became irregular and slightly weaker than normal, but not increased in frequency. About this time an enlargement of the veins of the feet and legs was noticed. This cardiac irregularity continued four days, gradually improving each day, and along with this irregularity was a sense of impending danger. Nothing whatever was given to combat these symptoms, for the patient refused to take anything but quinin. It is also well to state that the only drug taken before the antifebrin was a dose of calomel (about 5 grains).

A careful examination of the urine after the rash disappeared showed only a typical febrile urine, which later was normal. The case was diagnosed as one of intermittent fever, and the patient put on quinin in full doses, with the result that he resumed work on the fifth day. No unpleasant symptoms have occurred at any time since." (*Medical News*, Vol. LXXII, page 791.)

As a new application for this agent the following is interesting. Dr. Stephen Harnsberger of Catlett, Va. read a paper before the meeting of the Amer. Med. Asso., at Denver, in June last on "Acetanilid : Its Use as a Preventive Measure in Premature Expulsion of the Ovum." He states :

"From the published clinical reports on the subject, it is plain that its clinical application has been confined principally to its use as an antipyretic, and to a less extent, to its sedative action in various nervous disorders and for the relief of pain ; but so far as I am informed, Dr. J. H. Wolfe, of Elkton, Va., and myself are the first to find acetanilid a serviceable remedy in threatened premature expulsion of the ovum." * * * * *

and before closing by enumerating the brief notes of three cases sent to him by Dr. J. H. Wolfe, he gives as his conclusions the following :

"Acetanilid has proved of no less benefit in habitual than in simple threatened miscarriages. In a few cases of women who bore histories of habitual loss of the ovum during previous pregnancies, even where the symptoms were alarming—rhythmical uterine contractions, considerable hemorrhage and accompanied with more or less pallor and vomiting—a state of calm was quickly reached under the administration of acetanilid in doses of 10 to 15 grains—0.50 to 1 gram—at intervals of one, two or more hours." (*Journ. Amer. Med. Asso.*, Vol. XXXI, page 964.)

Also a report on the toxic symptoms produced by a so-called headache powder is of interest in this connection. Dr. R. E. P. Squibbs, a surgeon in Lenton, Nottingham, England, writes to the Editor of the British Medical Journal (Vol. II. for 1898 page 987) as follows :

"On September 5th last I was called at 9.30 p. m. to Mrs. B., a young married woman, who was suffering from symptoms alarming to her friends. She had complained of feeling unwell for some days past, and on September 5th had purchased a headache powder, which she took at 1 p. m. It quickly cured the headache, but soon produced effects of a most unpleasant kind. These included a feeling of numbness and 'pins and needles' in the limbs, faintness, lividity, coldness of the extremities, and a feeble pulse, with other

symptoms of collapse. The temperature was normal, and the mental condition unaffected. As an emetic would probably have been useless, the lady was successfully treated by stimulants, inhalation of ether, and the application of warmth to the extremities. The next day she was feeling fairly well, though hardly fit to perform her usual duties."

Acid Acetic as a menstrum for the exhaustion of crude drugs is now an accomplished fact. Since this time last year much work has been completed with it by more than one set of observers. A systematic series of exhaustions has been undertaken on a scale much larger than is possible in the experimental laboratory, and all of the officinal drugs of different coarseness of powder are now being treated in turn with varying strengths of the Acid until the proper conditions are found which will complete the exhaustion. The strength of Acid employed has varied from that used in the old Pharmacopœial products "Aceta" up to as high as 60 per cent. to accomplish the results, the aim constantly being to employ as weak an Acid as possible for obvious reasons. The resulting Fluid Extracts are found to be of the same quality and strength as the officinal products and should be equally effective. The veterinarians have naturally been much interested in these products and have studied the subject in the line of comparative therapeutics. From their encouraging reports further progress in the use of these products is now quite established. The reduction in cost is more of an item with the veterinarian than with the physician, but with the latter also the reduction will be found to be a marked feature. It will be found that the efficiency of the drugs so treated has been largely increased by the elimination of alcohol. Although Acetic Acid generally exhausts drugs more completely and thus naturally extracts a much larger proportion of inert matter, it will be noted that such a finished product gives much less precipitate on dilution with water than the alcoholic preparation. This fact will be appreciated by the physician in compounding his prescriptions, for although in some cases a slight precipitate will take place when diluted with water, yet in most cases it will be found to be so slight that it can be ignored, especially as it throws down little if any alkaloidal principles. In general then these Acetic Acid Fluid Extracts may be diluted without precipitation, of course, with Acetic Acid, but again even with alcohol to the tincture strength if necessary without giving more than a slight turbid solution, if any, and may be diluted with water without giving nearly as muddy or unsightly a solution

as the alcoholic preparation of the same drug. If the action of Acetic Acid be objectionable in any case such an excess may be neutralized as far as needed with either soda or potash, and the remaining slight acidity will be found to be rather beneficial than otherwise, not only to the alimentary tract but in some cases to the urinary bladder. An instance may be mentioned how a Fluid Extract of Buchu made with Acetic Acid can be enhanced in its effects by neutralizing at least some portion of the Acid present with potash, thus giving in the product Potassium Acetate and thereby procuring a combination largely used by genito-urinary practitioners.

Comparative trials of these new Acetic Acid products are therefore urged upon practitioners in general, to verify the favorable reports which have already been made from an increasing number of observers.

Acid Camphoric, produced by the oxidation of Camphor by concentrated Nitric Acid, has been little heard of in the current medical literature of the past year, but undoubtedly it is still being used with good results in the excessive night-sweats of pulmonary tuberculosis. A new combination of this Acid with Guaiacol has been obtained for which the name has been coined "*Guaieamphol*." It occurs in fine, colorless, odorless and tasteless crystalline needles, insoluble in water but readily soluble in diluted alcohol and chloroform. It is recommended for excessive night-sweats and diarrhea.

Acid Carbolic (Phenol) has been too frequently alluded to specifically to even attempt to make a short enumeration of its favorable applications. It may be well, however, to mention one or two combinations which apparently have met with some little success. Dr. Frank Parsons Norbury of Jacksonville, Ill., has expressed his preference for a combination of this Acid with equal parts of Camphor in the local application for the treatment of erysipelas. He found it to be a valuable antiseptic without showing any evidence of being an escharotic. (*The Medical Fortnightly*, Vol. XIII, page 223).

Another compound comes recommended from France. It consists of

Acid Carbolic	80 parts
“ Salicylic	10 “
“ Lactic	20 “
Menthol	1 “

for which the name of "*Phenosalyl*" has been coined.

It may be of interest to some observers to simply put on record here for reference the report of Captain R. C. Thacker of the British Army Medical Service, of his treatment of enteric fever by this agent at the British General Hospital, Nowshera, Punjab, India, where he states he had most excellent opportunity afforded of giving a further and more extensive trial to the Carbolic Acid treatment in enteric fever, and the following has been the result up to the present date :

Number of cases treated, 79.

Number of deaths, 11.

Percentage of mortality, 13.9 per cent.

His concluding remarks are as follows :

“ The following favourable signs appeared after the administration of the acid :

1. A rapid cleaning of the tongue with the abolition of the characteristic unpleasant enteric odour from the breath.

2. A sustained and remarkable lowering of the febrile temperature with a well-marked morning remission in many cases.

3. Marked improvement in the unpleasant odour from the stools, which in a few days become practically deodorized.

4. Tympanites, diarrhœa, and delirium were rarely excessive and easily under control.

5. A most favourable convalescence with a sound recovery.”
(*Brit. Med. Journ.*, Vol. II for 1898, page 888).

Acid Citric has been little commented upon for its individual action although some mention has been made of its use as a prophylactic in pertussis. It has been proposed to swab out the larynx with a 10% solution of Citric Acid in Simple Syrup. This not only destroys the bacilli but is claimed to act effectively against infection. It is recommended to carry out a very attractive plan, which no doubt would not be objected to by the children, of administering small quantities of Citric Acid Lemonade throughout each day to all who are living in the neighborhood of the infection. There is little doubt but that the children will come around often enough to prove any claims that may be put forward as to its value as a preventive.

Acid Hydrochloric has been discovered (somewhat by accident) to be of value in sciatica.

“ A somewhat remarkable instance is recounted in the *Semaine Médicale* of a patient having arrived at a successful method of

treatment for himself by the merest accident—an accident, too, which was founded on a blundering ignorance of chemistry. A man who had suffered for many years from sciatica was treated in an Algerian hospital by means of hypodermic injections of salt and water, but without much success. After he had left he bethought him that perhaps the salt was not strong enough and that a stronger preparation of salt might be more successful. He therefore procured some “spirit of salt” (hydrochloric acid) and painted it on the skin, getting rid of his long-standing trouble in a few days. Having occasion shortly afterwards to attend the hospital for some other affection he confided in Dr. Bourlier, professor of therapeutics, whom he saw, how he had managed to get rid of his sciatica. This gentleman thought the plan worthy of trial, and employed it in several cases with invariable success. He then told his son, Dr. Maurice Bourlier, who was house physician, and he treated a number of cases with great satisfaction to himself and to his patients. A thesis has recently been published on the subject by Dr. C. Genatas, of Montpellier, on the basis of a dozen cases of neuralgia of the sciatic nerve, all of which were completely relieved by this means. The procedure is simple enough. Half an ounce of strong hydrochloric acid is put in a small cup and a brush is dipped in it and applied over the painful part of the nerve, three or four coats being painted on. The limb is then enveloped in a cotton-wool dressing. Of course, the application causes a somewhat severe smarting sensation, but this is quite bearable. A few minutes afterwards the skin becomes reddened and hot, and sometimes bullæ are formed which fill with fluid. These even if they occur disappear in two or three days. Usually the patient feels better even after a single sitting. The application can be repeated in from twenty-four to forty-eight hours, but not again for several days for fear of producing sloughs. Of course, too, where there are bullæ they must be avoided in subsequent applications. No serious inconvenience is caused by the hydrochloric acid such as was experienced when a similar procedure was attempted some years ago by Dr. Legroux with strong sulphuric acid, which was found to be liable to cause extensive sloughing of the skin. The twelve patients referred to were all reported as cured in from three to five sittings extending over from a week to twenty-five days. It may be well to say that the hydrochloric acid of the French Codex is very slightly stronger than that of our own Pharmacopœia.” (London *Lancet*, Vol. II for 1897, page 1338).

Acid Lactic has been little heard of by itself in the medical literature of the past year, but Dr. James Donelan of London, England, takes occasion, in reporting on his special treatment of laryngeal tuberculosis by submucous injections, to speak of the indisputable good results from the local use of this Acid in the treatment of this affection, and that as far as he can understand it may be looked upon almost as a specific.

It has been reported by Dr. Ilkewitsch of Moscow, Russia, that he has satisfied himself experimentally of its efficiency as a destroyer of pathogenic micro-organisms in the utero vaginal tract.

“A three-per-cent. solution, injected into the vagina, he finds, overcomes the odor that may be present in cases of leucorrhœa, changes the color of the discharge from green or yellow to white, and may be used without danger in ambulatory practice and in cases of salpingo-oophoritis. In certain cases, he thinks, the intra-uterine employment of a stronger solution may be substituted for the use of the curette.” (*N. Y. Med. Journal*, Vol. LXVI, page 707).

Acid Mono-Chlor-Acetic has again been brought forward. It is one of the three chlorine compounds of Acetic Acid obtained by the action of chlorine upon Glacial Acetic Acid containing about 10% of Iodine. After distillation, that portion of the distillate is reserved which distills over between 180° C. and 188° C. (356° F. and 370.4° F.).

Dr. Jas. C. McGuire of Georgetown University, D. C., has reported (*Journal of Cutaneous and Genito-Urinary Diseases*, Vol. XVI, page 329) on the treatment of several cases of xanthoma with this Acid with gratifying success. No pain was experienced when it was applied although swelling sometimes occurred, which however soon subsided. He recommends that small portions of the skin only should be painted at one time, for the reason that it first turns the parts white and then shortly results in forming a dark crust which should not be disturbed but allowed to separate from the skin spontaneously. This treatment deserves following up and the results should be reported.

Acid Picric (Tri-Nitro-Phenol) continues to be considered of some value but closer observations are being made of its action. Dr. F. E. Tulley of Granite City, Ills. writes to the Editor of *The Journal of the Amer. Med. Association* (Vol. XXI, page 138) concerning the use of this Acid as first aid in the treatment of burns. He states that in the form of a solution he has obtained excellent results and desires to record several cases.

“Shock and septicemia are the most dreaded results from the more severe cases, but all this can be eradicated by the persistent use of a weak solution of picric acid.

During the past three years several cases have come under my care and all have been treated alike, much to my satisfaction. While I do not wish to be original in this sense I wish to recommend a good thing.

T. B. K., chemist, age 23 years, in opening a can of gasoline the escaping gases exploded, burning him frightfully about the body, face and extremities. He was carried to a building and when I saw him was suffering untold agonies. I immediately had prepared a saturated solution of picric acid and bathed the whole body in it, covering the body with cotton and bandages. After a few minutes he said the pain was all gone and fell into a sleep. Several others who got burned at the same time expressed themselves as relieved as soon as the solution was applied.

I generally make up a pint of solution at a time and dilute as wanted.

Picric acid	15.5 grammes (4 drachms)
Alcohol	125.0 “ (4 ounces)
Water distil.	250.0 “ (8 “)

Picric acid for burns of the first or second degree is the simplest, quickest and most satisfactory treatment in my hands. It deadens pain and allays suppuration, healing spontaneously, the only objection being its staining qualities.

I generally soak absorbent cotton and lay it smoothly on the wound, cover this with rubber tissue and leave it on for two days or until a new skin forms.

I also apply an ointment occasionally, composed of ichthyol and vaselin, which softens the hardened epidermis.

While I do not propose to bring out anything new in this modern treatment I hope at least it may be more often tried by those who have discarded the old fashioned methods so long employed on suffering humanity.”

Dr. Elliee M. Alger of New York has written an article “On Cutaneous Burns” which appeared in the *New York Medical Record* (Vol. 53, page 766) concluding as follows: “I have used it in a good many forms, but have found the combination with citric acid, as devised by Esbach for the detection of albumin in the urine, by far the most satisfactory:

Acid Picric	10 parts
“ Citric	20 “
Water	up to 100 “

Without any elaborate attempt to cleanse the skin of any except the worst of the extraneous matters, any bullæ should be opened with an antiseptic needle, freely but without any special attempt to express their contents. The fluid should be sopped on freely, care being taken that it reaches the interior of every vesicle. Picric acid alone is a rather weak acid, and coagulates albumin but poorly in an alkaline medium. The citric acid acidulates the alkaline exudate, which the picric acid promptly converts into an antiseptic coagulum, capable of excluding the air and resisting infection. The combination, after a momentary smarting, relieves the pain more quickly and completely than anything I have ever tried. After the excess of fluid has drained off, the part may be covered with soft gauze and not disturbed for several days. It makes a clean, comfortable dressing, and I have never observed any toxic effects. After the first dressing it should be reapplied every two or three days, only to those areas where exudative fluid has formed.

Picric acid is a good cornifying agent, and therefore hastens granulation, while its antiseptic action renders it especially valuable in those cases in which large granulating surfaces are suppurating. Here we must often stimulate granulation by use of nitrate of silver or balsam of Peru, while not infrequently we must avail ourselves of the resources of the surgeon and have skin grafting done. Large granulating surfaces should be dressed a part at a time, and dry powders will be found much preferable to ointments, which tend to confine irritating discharges near the surface.”

A note of warning has been made in reference to the indiscriminate use of Picric Acid dressings in the treatment of burns, in a communication presented to the Société de Chirurgie of Paris, at its meeting on January 19th last by Dr. Walther. The cases were two children whose burns had been dressed with 200 grammes of an ointment of the strength of 1 to 10, and both suffered from vomiting, intestinal pains, diarrhea, black urine and jaundice.

At the same meeting, Dr. Brun reported a death following the use of this Acid, in the case of an eighteen months' old infant, and he therefore had abandoned its use. Other surgeons at the meeting agreed that other antiseptics were as good and even better than this Acid. The majority, however, approved of its use as they had obtained good results. After some extended use Dr. Walther

has drawn the conclusion that infants appear to be very sensitive to it, and that even adults showed varying degrees of tolerance. (*Gaz. hebdom. de médecine et de chirurgie*, Vol. XLV, page 89).

Dr. Charles Willems of Ghent, Belgium, points out that Pierie Acid is really of use only in burns of the first and second degrees. The special action of the Acid is to favor the growth of new epidermis. In such superficial burns the utility of the agent, he holds, is beyond question. By means of it he has seen extensive burns of the face and limbs heal with great rapidity. Epidermisation takes place so quickly that no suppuration occurs. Another advantage of the Pierie Acid is its marked analgesic property. In burns of the third degree he finds the Acid much less useful; it does, indeed, check suppuration, but it has no effect in quickening granulation. As in practice, however, these three degrees of burns are generally present at the same time, the Acid may with advantage be used at first, as it soothes the pain and rapidly heals the superficial lesions; an antiseptic can then be substituted for the treatment of the granulating surface. The pain and the toxic accidents which have been placed to the discredit of Pierie Acid are to be attributed to the use of too strong preparations. He points out that a saturated watery solution has generally been used, compresses soaked in this being applied to the wound and allowed to dry on it. He points out that Pierie Acid is dissolved in water in the proportion of only about one-half per cent. He claims that the cases of poisoning reported to the Paris Surgical Society were rather misleading as the solutions used appeared to be of a strength of 5 and 10%. He contends that it is unfair to condemn an agent for effects due to its misuse. He uses the Acid in vaselin ointment of the strength of 1, or at most 2 per cent., 15 g. of this spread upon lint make a dressing suitable for a vast burn. Although most of his patients have been children, he has seen no sign of toxic effect, and the pain, when there was any, was slight and transient. The sole drawback is the yellow discoloration of the skin which the Acid produces. This can be gotten rid of by repeated washing with alcohol, or with carbonate of lithium diluted with water.

Dr. Fage reports in the *Lyon Medical* (Vol. LXXXVII, page 62) the satisfactory use of this Acid in the treatment of blepharitis in solutions of 5, 8 and 10 parts to the 1000, and in place of water he has found glycerin and water preferable for it adheres better to the ciliary border. He has obtained very favorable results in every instance of all kinds of blepharitis. He takes pains to free the lids

from any crusts that may be present by bathing them with a simple solution of either Boric Acid or Ichthyol. Such application is repeated every second day. In impetiginous and eczematous cases the sense of heat and itching rapidly disappear and the discharge if present subsides. In the glandular and ulcerative forms of this affection, after cleansing the ciliary border, he opens the little pustules, pulls out the lids that are most altered, touches the little ulcers with cotton saturated with a 10 to 1000 solution and then in about two minutes paints the whole ciliary border with a still weaker solution. He finds that such an application does not irritate either the skin or the conjunctiva, and if care be taken in the application of the solution to these little spots so that they alone are touched, the amount of yellow discoloration is so small that it is not conspicuous.

Some success has been obtained by using this Acid in cases of eczema where the inflammation is acute and superficial and where the lesions are mostly epidermic. In the chronic forms accompanied by induration of the skin and particularly by epidermic thickening, this Acid does not appear to give satisfactory results. In the acute cases with swelling of the integument, superficial ulceration and weeping, excellent results are obtained. Under its influence the inflammation rapidly subsides, and a protective layer composed of coagulated proteid substances is formed over the ulcerated and oozing surfaces, thus promoting rapid healing. Although it is of little benefit in chronic cases, yet both in these and the acute cases accompanied by itching, some relief is obtained. The acute cases are practically relieved in from 10 to 15 days. The solution used is that of the originator of this plan of treatment, Dr. Paul Thiéry, and mentioned here last year :

Picric Acid.....	3 parts
Tepid Boiled Water.....	250 “

This is painted over and somewhat beyond the affected surfaces, after which they are wrapped in lint well saturated but wrung out with the same solution. Then a covering of cotton-wool is placed over the whole. An important precaution is necessary in order to avoid maceration of the surfaces as otherwise it is pretty certain to occur. That is to refrain from using oiled silk as a protective covering. The dressings should be renewed every 2 or 3 days, and the recommendation of Dr. A. Brousse of Montpellier, France, spoken of here last year, should be carried out, and that is to

thoroughly wash the parts with a solution of boric acid so as to render the cutaneous surfaces as completely aseptic as possible.

Unexpectedly good results are reported from the use of the following solution in the treatment of suppuration of the ear :

Pieric Acid.....	200 milligrammes (about 3 grains)	
Alcohol.....	2.75 Cc.	(“ 45 minims)
Distilled Water ...	19.00 Cc.	(“ 300 “)

This solution is left for a few minutes in contact with the tympanum, producing a cauterizing effect of the secreting membrane. Desquamation of the tympanum and of the meatus occurs, which matter must be removed by frequently cleansing.

Actol (Silver Lactate), used as a surgical antiseptic, has not had much attention paid to it in the current medical literature of the past year. Its use in dentistry, however, has been noted. After removing disorganized pulp it has been used with good effect in cleansing the root canal of affected teeth. The cavity is recommended to be thoroughly washed out with a 1 to 2000 solution of this agent and then the other Silver Salt, the Citrate (Itrol) blown into it with an insufflator. In cases where the tooth pulp has been recently destroyed, a simple dusting of Itrol appears to be sufficient, but where the pulp has become putrid two or three applications of Actol seem to be necessary.

For convenience in using, tablets have been made of these Silver Salts. Silver silk, catgut and silver wool have been made with a solution of this agent—the latter has apparently been very effective in dentistry in packing a decayed tooth to remove the fetid odor.

Äirol (Bismuth Oxy-Iodo-Gallate) still continues to be used with success as an antiseptic. Its marked usefulness in the treatment of gonorrhea induced a trial to be made of it in a case of ophthalmia in a newly-born child, after having used Silver Nitrate with the result of rather increasing the extreme inflammation than diminishing it. A 5 per cent. ointment made with vaselin left in contact with the mucous membrane for 20 minutes and then washed off thoroughly with a solution of boric acid produced immediate improvement,—the swelling and conjunctival secretions being greatly diminished by the following day when a fresh application was made. Suppuration was entirely prevented thereby and in a week's time successful results were obtained.

Dr. Niessen in investigating the value of the various substitutes for Silver Nitrate in the treatment of gonorrhea concludes, in comparing with others, that the bactericidal activity of this agent is

less than that of Silver Nitrate. In many cases it acts as an irritant and sometimes causes turbidity of the urine. Although Dr. Niessen is an authority whose opinion deserves attention, the majority have obtained successful results in this affection.

Dr. George Wherry of Cambridge, England, has made a report on the use of "Aïrol Powder in Corneal Ulcer with Hypopyon." He reports as follows :

"The cases are common in agricultural districts, often as the result of slight injury, such as is received in 'cutting the quick,' that is, trimming the hedge, or when the eye is 'stubbed,' that is stabbed with stubble. Such lesions of the cornea seem very liable to infection : sometimes doubtless are fouled from the first, as when the scratch is received where the butcher bird has been at work, and covered the thorns of the hedge with putridity, but often the corneal wound is ill-treated before it can heal, and the tainted wound is bathed in microbic exudation, the irritating products of the microbes then rapidly affects the vascular tissues in the eyes, and causes the formation of pus in the anterior chamber. The pus can be watched through the clear and imperforate cornea. The ulcer may be a comparatively small one, but the patient will usually need admission to the wards, and sometimes incisions or the cauterization. Some of the most threatening cases have been successfully treated with aïrol powder in the following manner :

The eyelids are held open and the aïrol powder flicked on to the eye with a dredger, the powder turns gradually to an orange colour, and in three to six hours the conjunctival sacs are washed out gently with boric water, which brings out superfluous cakes of yellow powder. The aïrol is again used as before, and this proceeds every few hours, the eye being treated by the open method—no bandage or pad is used—but the patient is kept in bed.

The ulcer heals, and the pus is absorbed in a proportion of cases greater, as far as I can judge, than by other methods. The eye is singularly tolerant of the aïrol ; in no case have I seen signs of irritation from its use, and when incision and cauterization have been used the after-treatment by aïrol has seemed to be satisfactory.

At present I have not tried it in purulent ophthalmia. In herpes and ulcers of the glans penis, carbuncles, boils, and sloughing sores it has been useful in acting like iodoform, but without the objectionable odour." (*Brit. Med. Journ.*, Vol. I for 1898, p. 144).

Among other cases of Bismuth poisoning from the use of this agent, one case may be of interest to mention here. It was one in

which a practitioner injected into a psoas abscess somewhat over an ounce of a 10 per cent. emulsion with equal parts of glycerin and olive oil. Marked symptoms of Bismuth poisoning were manifest in the course of three days in the way of nausea, stomatitis and black coloration of the oral mucous membrane and other accompanying symptoms which did not subside until the abscess was freely opened and the Aïrol permitted to escape. The conclusions are drawn that glycerin should not have been used with it as its action is apparently more potent when dissolved in that excipient.

The general conclusions for the past year would be that Aïrol is an effective astringent and a moderately potent antiseptic, but it must not be expected that it will show its best results when a more energetic action is called for; then some of the more potent agents like Iodoform should be used. It is odorless and very cheap—two points much in its favor.

Alumnol—the astringent and antiseptic—has had little attention paid to it in the current literature of the year, although still quite prominent in its use.

Aminoform is the new name adopted for what has previously been known under the name of Urotropin, commented upon here last year. There is no reason given for the need of another name for the latter agent, but probably some enterprising manufacturer thought he could make a little capital out of a new name. Dr. Walter of Sulzbach, Bavaria, for instance, has reported on the use of Saligenin and this Aminoform in which the latter proved to be of value when used over lengthy periods in those cases predisposed to gouty attacks, as Saligenin seemed more especially useful in acute attacks (*Muench. Med. Wochensch.*, Vol. XLV, page 302).

Ammonol (so-called Ammoniated Phenyl-Acetamide), “the antipyretic, analgesic and stimulant,” is still largely advertised and employed, the majority using it obtaining most favorable results, but it is to be hoped that after the most conclusive publication of its composition, practitioners will be disposed to make up a prescription of the ingredients rather than insist upon their patients paying the disproportionate price for the already made-up and advertised article. It may be a convenience to some to have it again stated here this year that a careful examination of this article was made by Mr. George M. Beringer, of Camden, N. J., who made a full report in the *American Journal of Pharmacy* (Vol. 69, page 150).

Amyloform—the patented substitute for Iodoform formed by the combination of Formaldehyde with Starch—is still in use but less has been reported upon it than a year ago. Dr. Hugo Löwenthal of Berlin, Germany, reported at a meeting of the Berlin Society of Physicians on November 22nd last, that he had carried on a series of experiments on the disinfection of the intestine by Formaldehyde and found this form of that agent especially suitable for his purpose, for the reason that it does not break up into its ingredients until it reaches the intestine where it parts with its Formaldehyde just in proportion as the Starch is transformed into sugar. Upon examination of the urine he found Formalin present and a decided decrease in the sulpho-conjugated acids, the amount of which is known to indicate the degree of intestinal putrefaction. He concludes that this agent is an excellent intestinal disinfectant, the action of which may be controlled by frequent assays of the urine.

Anæsthesia, although always a very prominent subject in the minds of all medical men and particularly the surgeon, has been probably somewhat more prominent during the past year owing to the fact that various forms of anæsthetics have been brought forward. Much more attention also has been given to the detail of administration and therefore much good may be expected from such an agitation. The reckless use of anæsthetics in some quarters has been the subject of much comment and aside from the expense of such recklessness other conditions are quite prominent. Interesting “Remarks on 6657 Administrations of Anæsthetics Conducted at the London Hospital During the Year 1897” has now been published (London *Lancet* Vol. I for 1898, page 483).

Dr. L. Fuster who read a communication “On General Anæsthesia” before the Société des Sciences médicales in which he used two parts of chloroform to one of ether, has apparently verified what others, at least on this side of the Atlantic, have repeatedly found, and that is that the exciting stage is much reduced if not entirely eliminated by this mixture and the patient comes out in quite a normal condition. Vomiting is found to be much less frequent (*Nouveau Montpellier médical* Vol. VII, page 708).

The Schleich so-called compound (now at last acknowledged to be a mixture) has had quite a varied history in this country, especially in New York City, where its advantages have been strongly urged. The Petroleum Ether element, however, is gradually being

abandoned and those observers who claim the great advantage of combination are looking for another product which will fill the place of the omission and accomplish the objects Schleich was aiming at. Too little attention and consideration are given to the question of careful administration with the already well-known anæsthetics. It is justly claimed by many that if as much consideration be given to the use of minimum quantities of chloroform and ether properly applied, as has been insisted upon with the Schleich mixture, little complaint could rightly be made with the older anæsthetics. The enthusiasts of Schleich's mixture are bragging over the extended series of administrations without disagreeable or unfortunate results, and appear to ignore the overwhelmingly greater list of favorable results when the older anæsthetics were administered with equal care.

Dr. D. H. Galloway of 200 Oakwood Boulevard, Chicago, Ills., in an article written by him entitled "The Administration of Anæsthetics" (*Journ. Amer. Med. Assn.*, Vol. XXX, page 1141) has called attention to his plan of counteracting the decomposed products of chloroform resulting from contact with exposed gas-light in the operating room, and states that his practice has been to saturate a towel with ammonia water and hang it up, or to scatter a little ammonia water about the room. This no doubt will accomplish the results as far as it goes, but it must be remembered that if sufficient ammonia was thus distributed in some operating rooms known to the writer the quantity necessary would be quite as irritating to all present including the patient as the chlorine compounds, although probably not as dangerous.

Analgen (Ortho-Oxy-Ethyl-Ana-Mono-Benzoyl-Amido Quinoline) has been unheard of during the past year, and it may be that its use is on the wane.

Anäsin, the new synthetic hypnotic and anæsthetic alluded to here last year, has been unheard of in the literature of the past year, and the further researches which were urged last year have evidently either not been undertaken or those investigating are not yet ready to report.

Anilipyrin—the mixture of Acetanilid and Antipyrin offered as a new antipyretic and analgesic—has not been thought of sufficient importance to allude to in any of the medical literature of the year, and the clinical reports which were promised last year have not yet appeared.

Anozol—the mixture of powdered Thymol and crystals of Iodoform—being merely a name coined for this mixture would not necessarily appear again as a special article of importance, and therefore it is not difficult to understand how it has been omitted from the literature of the year.

Antinosin (Sodium salt of Tetra-Iodo-Phenol-Phthalein) has undoubtedly held its own during the past year. It has been recommended as a valuable addition to tooth and mouth washes, either by itself or in solution. Being readily soluble in water, odorless, non-toxic and almost tasteless one can readily appreciate its application. It is well to bear in mind, however, that it is quite necessary to use distilled water to obtain a clear solution, but again it is best dissolved in glycerin, which solution keeps much better than others. The proportions recommended for a mouth wash are 5 Ce. of a 1 per cent. solution in a tumblerful of water. No discoloration of the teeth occurred in one case reported of a 1 per cent. solution being used for over a month. A little peppermint water is recommended to improve the taste of the solution, if desirable. In cases of caries of the teeth and in salivation from the use of mercurials good results have been obtained with a 2 per cent. solution.

The laryngologist has made good use of this article throughout the year, quite frequently in the form of a spray. A precaution has been mentioned by more than one which it may be of service to repeat here, and that is before spraying the nose and throat of patients, it may be well to call their attention to the color of the solution to be used, otherwise if any of the fluid happens to be retained in the passages and is expelled later, they may immediately infer that a hemorrhage exists. Even the practitioner himself is deceived at times if he does not remember for the moment that that was the color of the solution he introduced.

In the treatment of the eye and ear this agent has been of use. Dr. W. Franklin Coleman of Chicago, Ills., reports (*Journ. Amer. Med. Assn.*, Vol. XXX, page 256) his results in the treatment of diseases of the eye and ear as follows:

“For some time I have felt the need of an antiseptic remedy which would be efficient, and non-irritating to the eye. While formalin is one of our best, if not the best of antiseptics, a solution of even 1 to 5,000 causes considerable pain. The action of sublimate is very superficial, and clinically unsatisfactory. Boric acid and iodoform are only very slightly antiseptic. I have also desired to get some of the properties of iodine, the tincture of which is well

known to be curative when applied to ulcer corneæ; on account of its irritative effects its usefulness is very limited.

I have recently used antinosin in a considerable number of cases (both in my private and clinical practice) of catarrhal, palpebral and follicular conjunctivitis, phlyctenulæ, ulcer corneæ, blepharitis marginalis, and also in otitis media purulenta. In a 1 to 2 per cent. solution it does not cause pain in the eye or ear, the patient rarely complaining of any unpleasant sensation. Antinosin is the sodium salt of tetra-iodo-phenol-phthalein. It is a dark blue amorphous powder, readily soluble in water and alcohol, odorless, non-toxic and non-irritant. It makes a purplish solution in water. The stain caused by very strong solutions can be readily removed by washing."

He then concludes with a short enumeration of eight out of his many other eye and ear cases which had been treated with good results.

Dr. Claude A. Dundore of Philadelphia, Pa., has evidently continued his investigations with this agent, for in addition to his previous report of its use in surgery, alluded to here last year, he now has published a paper on "Nosophene and Antinosine in the Treatment of Genito-Urinary and Venereal Diseases with report of Cases"—all with beneficial effects.

His cases were 4 of simple Urethritis, 11 of simple Elytritis, 3 of Abscess of Vulvo-vaginal gland, 6 of Herpes Præputialis, 5 of Chronic Cystitis, 4 of specific Balano-posthitis, 4 of specific Elytritis, 16 of specific Urethritis, 5 of chronic specific Urethritis, 3 of Gleet, 5 of Bubo, 6 of Chancre and 3 of Chancroid.

Dr. Niessen in his comparative experiments with some of the new substitutes for Silver Nitrate in the treatment of gonorrhea, reports that Antinosin possesses no particular advantage over Silver Nitrate, although it may sometimes be substituted for that salt with advantage (*Muench. Med. Wochensch.*, Vol. XLV, page 359).

Antipyrin (Phenazone) has been an article of increased interest this year by reason of the fact that the fifteen year limit of the German patent expires and at this date it is thrown into the open market for general competition. This fact will not increase its use by any means, for those who have made any use whatever of it claim that it is a necessity to them, therefore any price which may be assigned must be paid. However it will be a saving to the patient for he is really the one who eventually has to pay the bills. It is to be hoped that if any increase in the use comes from the natural

drop in the price that it will not lend its influence to the already existing abuse of this important agent.

Practitioners throughout the world are now too familiar with the general use and abuse of this agent to expect that any attempt at exhaustive comments here will be of sufficient value to even read over hurriedly. Therefore the few remarks made here will be only those picked out from a much greater number to illustrate or allude to some special uses which are not necessarily known by the general practitioner, and are simply enumerated here to bring them together for ready reference.

An interesting letter addressed to the Editor of the *N. Y. Med. Record* (Vol. 53, page 501) by Dr. G. Frank Lydston of Chicago, Ills., on this agent as a local anæsthetic reads as follows:

"I desire to call attention in this preliminary note to what promises to be a new departure in genito-urinary surgery. I have used, as a substitute for cocaine in a number of cases of urethrotomy, a ten-per-cent. solution of antipyrin in a one-per-cent. solution of carbolic acid. As far as my observations have gone, the solution appears to be quite as efficacious as cocaine. In meatotomies, when, as is well known, the skin incision is usually painful, I have found even less complaint than when cocaine is used.

The advantages of the agent as compared with cocaine are 1, absolute safety; 2, freedom from constitutional effects; 3, distinct lessening of hemorrhage, both before and after operation; 4, less disturbance of nutrition of the wounded tissues.

I have thus far used only a ten-per-cent. solution of antipyrin. I have not experimented as yet with a simple aqueous solution. The solution should be fresh, and should be allowed to remain in the urethra for ten minutes, as a rule. I have, however, begun cutting within five minutes after injecting it. I would suggest the antipyrin solution for nose and throat work. It will at least make a safe foundation for further anæsthesia with cocaine. Absorption of the cocaine and hemorrhage will both be inhibited, thus adding greatly to the safety of operations. Unlike that of cocaine, the styptic effect of antipyrin is not followed by vascular relaxation and often almost uncontrollable hemorrhage."

The following note on the value of Antipyrin in Labor will be of interest:

"The very extraordinary number of ailments in which antipyrin has proved itself useful leads one on one hand to believe all that can be said in its favor, and on the other to doubt the possibility of

its proving efficacious in any additional conditions to those in which we already employ it. It is worthy of note, however, that very shortly after antipyrin was first brought forward as a pain reliever several clinicians suggested its use for the purpose of relieving the pains of labor. It is not surprising therefore, to find that it has been largely used, and that we are now in a position to decide as to its pain-relieving powers in the parturient state. Increasing knowledge of this drug has certainly shown that whatever power for good it has is confined to practically one stage of delivery. It seems hardly necessary to emphasize the fact that it can under no circumstances supplant the ordinary anæsthetics, and it must be remembered that the coal-tar products prove themselves useful in those forms of pain which may be called nerve-lesions, and are usually practically powerless in the pains of inflammatory processes.

According to the studies of Misrachi it is a useless remedy for the pains of a perfectly normal labor, but finds its chief usefulness in those cases where the pains are so excessive as to reflexly interfere with the proper uterine contractions. In this condition he asserts that it is most efficient. Misrachi decides, too, that it is indicated in tedious labor when the pains are severe. He also believes that it is useful when the liquor amnii has been discharged too early and where there is rigidity of the os. In regard to the second stage of labor Misrachi concludes that antipyrin is useless. There is evidence, however, that antipyrin has considerable ability to relieve the so-called after-pains. It is also seemingly a fact that antipyrin may be used with some success for the purpose of quieting a tendency to the development of pains before the full term has been reached. If it is intended to use antipyrin for the purpose of arresting a threatened miscarriage, then its dose must be very large—as much as thirty or forty grains given in two or three doses of fifteen grains each at half-hour or hour intervals.” (*Ther. Gaz* Vol. XXI, page 741.)

Dr. P. Ardin-Delteil of Montpellier, France, has published in detail an account of a case of acute dysentery in his practice in which he injected through the rectum 4.5 grammes (about 75 grains) of this agent three times each day with favorable results (*Nouveau Montpellier médical* Vol. VI, page 833).

Dr. G. Lemoine has recommended this agent as effective in the early stages of fatty diabetes as described by Lancereaux. He apparently has administered varying doses, but has never exceeded the maximum of 3 grammes (about 45 grains) each day. His

usual daily dose has been put up in cachets according to the following formula :

Antipyrin	0.75 to 1.00 gramme
Sodium Bicarbonate	0.50 to 0.75 “

(*Le Nord Médical* Vol. 5, page 109).

Some observers still continue to notice a peculiar eruption following the administration of this agent. It would seem at times as if such phenomena occurred more frequently with certain practitioners. Dr Wilhelm Wechselmann of Berlin, Germany, has written an article entitled “Antipyrin-Exanthemata” (*Deut. Medicin. Wochensch.* Vol. 24, page 335). He relates five of his cases in which he has found considerable difficulty in assigning the cause of this peculiar rash. He finds it sometimes covering the whole body and at other times confined to definite areas. He thinks that when located in such definite areas it should be attributed to syphilis. He has noted that frequently the rash appears only after Antipyrin has been taken for some little time, thus making the patient think that the rash cannot be due to the remedy. The rash apparently is not as frequent as one would expect from the abuse to which this agent is put. The dose also seems to have little effect.

The following letter on the incompatibility of Antipyrin and Sodium Salicylate in powder form written by Dr. Wm. J. Robinson of New York City to the Editor of the *N. Y. Med. Journal* (Vol. LXVI, page 606) will be of interest :

“Permit me to call the attention of the readers of your valuable journal to the fact that antipyrine and sodium salicylate can not be dispensed together in powder form : immediately or within a short time liquefaction takes place, and when the powders reach the patient he is likely to find no powders at all, but only thoroughly soaked pieces of paper. Though for practical purposes it is immaterial whether the change is of a chemical or of a purely physical nature, it is my opinion that the liquefaction occurs in virtue of a true chemical reaction. Helbing, in his *Modern Materia Medica*, says : ‘The reaction of sodium salicylate and antipyrine, sometimes stated to be the result of a chemical change, has been decided by careful research to be merely the result of deliquescence, the salicylate acting as a carrier of moisture to the more soluble antipyrine (spica).’ To this statement I am unable to agree. Sodium salicylate is permanent in the air—*i. e.*, it does not attract moisture ; nor is antipyrine *more* soluble. Rather the contrary. Antipyrine

is soluble in one part of water, while sodium salicylate is soluble in 0.9 part of water. Nor does sodium salicylate contain any water of crystallization which might be liberated during trituration and act as a solvent for the antipyrine (as is the case with many salts).

The subject of the incompatibility of the two above mentioned drugs was recalled to my mind by an occurrence which took place a few days ago. A physician was called in to a patient suffering with acute articular rheumatism; the fever was very high, and the pains were excruciating. The doctor prescribed powders of phenacetine, antipyrine, and sodium salicylate, and the druggist was asked to make them up in a hurry. It was a damp evening, and when the medicine was brought to the patient there was *not a particle of powder* left, only a wet box of papers. The druggist was asked for an explanation, but he said that it was none of his business, that he made up the prescription as the doctor wanted, and if anything was wrong, they should apply to the latter for information. They went to the doctor—he was out and another physician was sent for. He relieved the patient by a hypodermic injection of morphine and prescribed capsules of phenacetine and salol; he was asked to take further charge of the case. Thus, non-familiarity with the important but sadly neglected subject of incompatibilities lost the physician a good family.”

The following communication relating a case of stomatitis produced by Antipyrin sent to the *British Medical Journal* (Vol. II for 1898, page 807) by Dr. G. King Martyn, is of interest:

“A short time ago I prescribed for a patient—a man of about 35—suffering from rheumatic neuralgia, a mixture containing antipyrin. After I had written the prescription he remarked, ‘My doctor tells me I cannot take antipyrin, as I always get a sore mouth if I do.’ Having prescribed antipyrin in some hundreds of cases, and having never seen such a result, I ignored this statement and did not tell him I was giving it to him. The next day his pain was gone, and he felt practically well; but the following morning he turned up again to show me his mouth. He had three or four patches of superficial stomatitis on the buccal mucous membrane between the gums and the cheek, and two or three patches on the hard palate. He had no erythematous rash or other symptom of antipyrin poisoning, and the drug used was, I believe, pure.

In the current Braithwaite’s Retrospect is a report of a case of pemphigus of the mucous membrane of the mouth following antipyrin, and I should imagine that my patient’s stomatitis probably

started in the same way. The condition is, I believe, very rare. The whole amount of antipyrin taken did not exceed 40 grains."

Dr. R. Immerwahr of Berlin, Germany, has reported "A Case of Antipyrin-Intoxication" (*Berlin. klin. Wochensch.* Vol. XXXV, page 751).

Mr. D. Gray Newton of Sheffield, England, has published his "Notes on Two Cases of Poisoning from Antipyrin" (*British Quarterly Medical Journal* Vol. VI, page 133).

Antitoxin has received considerably more attention during the past year than in the previous year, and therefore it would be quite impracticable to attempt even to enumerate here every individual mention of this wide spread agent. Much more attention has been rightly given this year to the question of testing the various brands offered in the market. The New York State Board of Health has recently determined to have all the Antitoxin manufactured in the State pass a series of tests at stated intervals. This will not only insure a proper standard of quality but determine a certain uniformity of product, and thereby a uniformity in therapeutic results. It is interesting to learn, even though it does come through newspaper authority, that much confidence is felt among the Russian peasants, for instance, in the results obtained by this mode of treating their patients. This has led to the establishment of as many as eleven laboratories there which are now engaged in the manufacture of diphtheria Antitoxin alone. It is by no means to be inferred, however, that all observers are satisfied with the efficiency of this form of treatment. There is still much scepticism, and the critics are very emphatic in their denunciations at times. Dr. C. T. McClintock of Detroit, Mich., is very outspoken in expressing his opinion of the worthlessness of the tests for diphtheria Antitoxin (*Med. News* Vol. LXXI, page 556). He adopted the plan of sending a bottle of this serum divided into four parts to bacteriologists of large experience in this kind of testing in different quarters of the East. One went to the University of Michigan, another to Detroit, the third to Philadelphia and the fourth to New York City, and the returns all differed. This would look rather discouraging to those expecting much from the definite results of testing. However it would appear in general that the testimony of the great majority is in favor of the beneficial action of the Antitoxin form of treatment, and many observers who have wavered in the past are now becoming gradually convinced that there is more of value in it than was at first supposed. All sceptics, however, are not as severe

as Dr. McClintock. The following criticism will be found more moderate. Prof. Purjesz of Budapest, India, read an interesting paper on "A Criticism of Serum Treatment for Diphtheria" at a recent meeting of the local Medical Society, which has been styled as a brilliant discourse on the subject :

. . . "in which he said that although he was by no means an adversary of the treatment yet he could not consider the utility of serum injections as proved. The advocates of serum treatment maintain that since its introduction the mortality from diphtheria has diminished. The Hungarian statistics show that the mortality from diphtheria had fallen in 1895 from 22,000 to 17,000, but it had also fallen from 1892 to 1894 (before the introduction of serum) from 49,000 to 22,000. The advocates of the serum treatment further state that the relative mortality from diphtheria had also greatly diminished and the figures, if not closely scrutinized, would seem to confirm this statement, for the statistics show that of 872 patients treated with serum 156 died—i. e., 17 per cent. ; whereas, of 2889 patients not treated with serum 1187 succumbed—i. e., 41 per cent. But these figures are misleading. It is evident that all those who received injections of serum were entered in the statistics indiscriminately whether the attack had been a mild or serious one, whilst of those who did not receive injections only the serious cases were noted which had passed through the hands of a medical man, the slight cases passing unnoticed. The omission of these mild cases will amply account for the difference of the numbers. Hospital observations are fallacious on the same grounds. In the Budapest Stephanie Hospital for Children the mortality from diphtheria had sunk from 70 per cent. to 20–22 per cent. since the introduction of serum, but that appears in an altogether different light when we learn that the morbidity of this disease had been steadily declining in Budapest since 1892, so much so that in spite of the increase of population it was reduced in 1895 to one-half of what it had been in the year 1892. Apart from the mildness of the epidemic there remains yet another factor to account for the relative decrease of mortality. In the year 1892 12 per cent. of all children suffering from diphtheria in Budapest were treated in the Hospital for Children, whereas in 1895 the hospital cases amounted to 22 per cent. of the children suffering from diphtheria, the explanation of which is not to be sought for in the epidemic—this having been milder in 1895 than in 1892—but in the fact that many milder cases had been brought to the hospital for the purpose of the

administration of the serum. Professor Purjesz, in conclusion, adduced some other striking arguments and repeated his conviction that the alleged usefulness of the serum treatment still remains to be proved." (London *Lancet* Vol. I for 1898, page 130.)

Dr. Louis Martin, head of the Laboratory in the Pasteur Institute, related an interesting series of statistics at a Conference on Diphtheria on December 21st last showing the advantageous results of the diphtheria Antitoxin (*La Médecine Moderne* Vol. 9, page 73).

In an Address on the serum treatment and its results delivered at the Annual Meeting of the Southern Branch of the British Medical Association, Mr. W. E. Green condensed his experience about as follows: He collected together from his notes the results of 36 cases of tetanus treated with Antitoxin, giving 25 recoveries; 40 cases of puerperal fever and allied conditions with 33 recoveries, and 11 cases of pneumonia with 9 recoveries.

Another observer relates that out of 84 persons vaccinated against typhoid fever during an epidemic, not one contracted the disease, while out of 120 who were unvaccinated under similar conditions 16 were attacked. It was also related that in 5251 cases of the plague which were inoculated with the plague serum there was a mortality of only 1.75 per cent., whereas out of 14830 treated by other means 20.6 per cent. died.

Dr. Dieudonné has recently summarized the results of this form of treatment of bubonic plague in a paper entitled "The Results of Yersin's and of Haffkine's Experiments in Immunity to and Cure of Plague" (*Muench. Medicin. Wochensch.* Vol. XLV, page 166).

Equally good reports are heard from Antivenene. At a meeting of the Medical Society of Victoria, Australia, Dr. C. J. Martin of the Melbourne University who has been experimenting with anti-venomous serum read an interesting paper based on a number of very careful experiments:

"He showed that the venoms of all Australian snakes contain at least two proteids; one is coagulated and rendered inert by heating to 85° C., and the other is not coagulated even on boiling. It is, however, sensitive to heat, and even momentarily boiling it diminishes its toxic property and prolonged heating destroys it. The two constituents can be isolated by filtration through a film of gelatin supported in the pores of a porcelain filter. The coagulable proteid destroys the blood corpuscles and the continuity of the capillary

walls, produces intra-vascular clotting if reaching the circulation with sufficient rapidity, and is a powerful poison to cardiac muscle. The non-coagulable constituent has none of these properties, but affects particularly nerve cells, those of the respiratory centre being especially susceptible. Cobra venom consists very largely (98.25 per cent.) of an uncoagulable proteid similar in action to the one in Australian snakes, consequently it would be expected that Calmette's serum from an animal immunised against cobra venom would have a diminished value against the mixed venom of Australian snakes, although Calmette affirmed that it was equally valuable as a remedy against the poison of all snakes. The result of Dr. Martin's experiments showed that the serum possesses some slight immunizing power against the venom of the tiger snake when administered intravenously and one hour before the inoculation of the poison. Injected hypodermically before or coincidentally with the venom the animals (rabbits) died. The effect on the different constituents separately was then tried and he found that against the uncoagulable element the serum has a decided protective influence when injected in considerable quantity directly into the circulation just before the poison is inoculated. This power is so slight that the serum is practically valueless as a remedial agent. Dr. Martin also suggests that antitoxin remedies of all kinds, as diphtheretic antitoxin, should be introduced directly into the circulation instead of under the skin, whence they may not be wholly absorbed for twenty-four hours." (London *Lancet* Vol. II for 1897, page 1292.)

Up to this time there appears to be little satisfaction in treating tuberculosis by this means. Dr. Charles Denison of Denver, Colo. has given some attention to this line of treatment, and read a paper before his local Association in December last in which he discussed "The Direct (Tuberculin Preparations) versus the Indirect (Animal Serum) Method of Immunization Against Tuberculosis" (*Journ. Amer. Med. Asso.*, Vol. XXX, page 290), relating six cases.

One of the latest affections in which successful serum treatment has been obtained is yellow fever, and Dr. Edwin Klebs of Chicago, Ills., has been reported as discovering the amœba of yellow fever. Dr. Joseph Sanarelli, the Director of the Hygienic Institute of Montevideo, Uruguay, has continued his experiments with the serum treatment in yellow fever, and has made the following report: 8 patients were treated vigorously in St. Sebastian Hospital of Rio

Janeiro, Brazil, and all recovered. Having met with such success he rendered immune all other patients, thus aborting an epidemic. No other cases occurred, he states, although an epidemic was still raging in an adjacent town (*Annales de l'Institut Pasteur* Vol. XII, page 348).

It has been reported that Dr. A. H. Doty, Health Officer of the Port of New York has received some of Dr. Sanarelli's yellow fever serum direct from his Hygienic Institute.

As is well-known by all at this time, Prof. Behring has succeeded at last in obtaining a patent for his diphtheria Antitoxin in the United States. He has been working for this for some years back, and the authorities at Washington have evidently concluded that he is rightfully entitled to a patent. At first sight this would seem quite unfair to the American manufacturers, but it is now learned from the Chief of the Agricultural Department at Washington, that the method of manufacturing this agent which is employed by the Department, does not infringe upon Behring's patent, and therefore if the latter desires to contest this ruling, the Courts will have to decide.

In a paper read by Dr. John H. McCollom of Boston, Mass., before the Mass. Medical Society in June last on "Antitoxin in the Treatment of Diphtheria," he summarizes tersely in about the way quite a majority of observers in this country have done. He concludes as follows:

"From an examination of mortuary statistics, both in this country and in Europe; from a clinical study of 4,200 cases of diphtheria, it seems to me that the following conclusions are absolutely correct:

First, that the death-rate of diphtheria has been reduced to a remarkable degree by the use of antitoxin.

Second, that in order to derive full benefit from this agent it is important that it should be given in large doses early in the course of the disease.

Third, that antitoxin should be frequently repeated, until the characteristic effect is produced on the diphtheritic membrane.

Fourth, that antitoxin does not cause albuminuria, and that it has no effect in producing heart complications in this disease.

Fifth, that the physician who does not use antitoxin in the treatment of diphtheria fails to do his whole duty to his patient" (*Boston Med. and Surg. Journ.* Vol. CXXXIX, page 153).

The question of immunization has received very prominent

attention during the past year, and the reports are beginning to be very interesting and satisfactory. Dr. Slawyk of Berlin, Germany, has reported on "The Immunization of Sick Children with Behring's Curative Serum" in which he states that from 1894 up to the present time all the children in the Charité Hospital of Berlin have been immunized against diphtheria, with the exception of a short time during the latter part of 1897. The reason it was then stopped was that the epidemic existing just at that time was quite mild, and as it was so mild it was thought that it was itself produced by the Antitoxin then being given. Not long afterwards four of the children were attacked, whereas none had been affected during the immunization period. The immunization was immediately renewed according to the previous custom every three weeks, which again resulted in no cases appearing (*Deut. Medicin. Wochensch.* Vol. XXIV, page 85).

Equally good results are reported from most of the other prominent cities in Germany and also from Paris, France.

A report has been made to the Clinical Society of London, England, by a representative committee of its own selection, on the value of Antitoxin treatment in diphtheria in accordance with the results obtained in the various London Hospitals (London *Lancet* Vol. I for 1898, page 1631). The concise abstract is as follows:

"In its main results the investigation into the use of antitoxin in diphtheria undertaken by a committee of the Clinical Society of London harmonises with the experiences which have from time to time been published in different quarters. The summary report read by Dr. Church at the last meeting of the society does not enter into details, but gives in general terms conclusions which are eminently favourable to the value of the treatment. The committee would appear to have taken great pains to avoid fallacies and to have made a rigid selection of the reports furnished to them from various hospitals in order that erroneous inferences might be avoided. By comparison of the series of cases treated with antitoxin with another series not so treated it would seem that the use of the serum was marked by a reduction in the fatality of diphtheria from 29.6 per cent. to 19.5, a reduction most marked in patients under the age of five years. But perhaps the most striking evidence of the efficacy of antitoxin, particularly when it is early administered and in adequate amount, is to be found in the results of tracheotomy. It would seem that since its employment there has been a diminution of cases requiring tracheotomy and, what is more

obvious, a very marked lessening of the mortality amongst those subjected to this operation. A fall in fatality-rate from 71.6 per cent. to 36.0 per cent. speaks volumes and by itself must carry conviction as to the powerful action exerted by antitoxin upon the local process. The committee inquired into the relative results accruing from variations in the period of the disease at which the injections were made, and also the comparative effects of different amounts injected at once, but we must wait for the full text of the report before being able to give their experience in these particulars. It was stated, however, that no connexion could be discovered between the amount of antitoxin injected and the subsequent occurrence of paralysis. It is instructive to learn that in very nearly one-third of the cases some form of rash, mostly erythematous, occasionally urticarial, supervened at periods varying in the majority of from six to twelve days after the injection. These rashes were accompanied by rise in temperature in about one-half of the cases and in a certain number by joint-pains. As regards suppression of urine no difference was observed in the liability to this grave event amongst those treated and those not treated by antitoxin. The general result of the inquiry is succinctly yet sufficiently stated to have been 'that in the cases treated with antitoxin not only is the mortality notably lessened, but the duration of life in fatal cases is also prolonged,' and it is added: 'The injection of antitoxin may produce rashes, joint pains and fever; with these exceptions no prejudicial action has been observed in the series of cases investigated to follow even in cases in which a very large amount of antitoxic serum has been used.' This deliverance, modest though it be, made after most careful scrutiny of clinical facts, should go far to establish the routine employment of antitoxin and encourage the hope that as time goes on its efficacy may, by improved methods, be even more strikingly exhibited. The thanks of the profession are due to the committee and especially to its chairman, Dr. W. S. Church, and its secretary, Dr. W. Pasteur, for the manner in which their important task has been accomplished and the clearness with which its conclusions are stated."

Probably next in the attention of all practitioners, tetanus will hold an important place and much has been written about it. About as satisfactory a summing up for the year as can be found, as far as the United States is concerned, is contained in a paper read by Dr. Fred. B. Lund of Boston, before the Mass. Med. Society in June last entitled "The Antitoxin Treatment of Tetanus"

(*Boston. Med. and Surg. Journ.* Vol. CXXXIX, page 160) in which he concludes as follows :

“(1) Although the statistics of the antitoxin treatment of tetanus up to the present time apparently show a diminution in the mortality under this treatment, they may be legitimately criticised as on the whole insufficient in total number, in definiteness of reports, and as probably not including all fatal cases treated.

(2) The more carefully we study them the less evidence do we find that the antitoxin treatment, and not the mild course of the disease, was responsible for the favorable course in the cases which have recovered. There is no satisfactory evidence that harm has resulted from the injections.

(3) There is a distinct probability that in the great majority of the total number of cases treated the dose of antitoxin, especially the all-important initial dose, has been too small to have any possible effect upon the disease.

(4) The treatment in view of the present untractability of the disease demands further trial.

(5) There are certain means by which we can hope to make it more effective, and these include earnest efforts on the part of those engaged in the production of serum to secure a stronger product, and on the part of those who employ it in treatment to give a sufficiently large initial dose, and to give it at the earliest possible moment. The serum should be injected directly into the blood stream.

(6) The strength of the antitoxic preparations furnished by the Massachusetts and the New York Boards of Health, when first supplied, was so slight as to render it necessary to employ 500 cubic centimetres as the initial dose.

(7) A valuable field for the use of antitoxin lies in its employment for immunizing purposes.

(8) The treatment of tetanus, according to our present knowledge, should consist of :

a. Thorough disinfection of the primary focus by mechanical means, including, if necessary and practicable, amputation.

b. The thorough local employment of such chemical antiseptics as have been shown to destroy both the bacilli and the toxin.

c. Symptomatic treatment by sedatives, etc.

d. Thorough diuresis.

e. Intravenous injection of an amount of antitoxic serum which shall contain at least 500 antitoxic units at the earliest possible moment.”

This is not only an interesting paper as far as the summary goes, but for one who desires to study the literature more exhaustively in detail, it is quite valuable on account of the Bibliography with which Dr. Lund closes his article.

Drs. A. Chauffard and Quénu reported a case of traumatic tetanus cured by intracerebral injections of Antitoxin by the method of Drs. E. Roux and A. Borrel, in which a sixteen year old boy entirely recovered (*La Presse Médicale* Vol. 6, first half, page 325).

Dr. M. Bilhaut was led to try injections of Antitetanus Serum into the nerve centers in traumatic tetanus by the report of a successful case by Dr. Quénu. In this case of an eleven year old girl double craniectomy was found necessary and intracerebral injections were accomplished after which all the grave symptoms are reported to have disappeared, leaving the patient in a seemingly satisfactory condition. However unfortunately she died.

It must be remembered that investigations must be pushed for some time longer before it can be definitely decided as to the value of the serum treatment in tetanus, for this modern treatment is yet on trial and the evidence must continue to accumulate considerably before the claims of many can be corroborated. A summary of the subject is very well put by the Editor of the *British Medical Journal* (Vol. II for 1898, page 741) as follows :

“ When antitoxic serums were introduced, tetanus was one of the diseases in the treatment of which their value seemed most probable. It can, however, hardly be claimed that results have fully borne out such favourable anticipations. The utility of the antitetanic serum, of which no fewer than three varieties are on the market, is inversely proportional to the acuteness of the disease, or in other words good results can only be awaited with confidence when the symptoms tend from the first towards chronicity. The reason of this appears to be the rapid production of toxin by the bacilli, even when present in limited numbers. As with syphilis the first symptom of the disease indicates that general infection has already taken place, and that the toxic products have obtained a long start. For each hour of this start the quantity of antitoxin required to avert a fatal issue must be increased almost in geometrical progression. In these circumstances it became obvious that the therapeutic action of tetanus antitoxin was in general much less than that of antidiphtherial serum, and most authors have in consequence spoken guardedly as to its value. Ehrlich's theory that the formation of antitoxins within the body arises from the affinity

of toxins for certain cell elements by a mutual adaptation of molecules—the so-called “lock-and-key” theory—has acquired practical importance as the result of the experiments of Dr. A. Wassermann of Berlin, Germany, and Dr. T. Takaki of Tokio, Japan (*Berlin. klin. Wochensch.* Vol. XXXV, page 1) on the relation of the central nervous system to the tetanus poison. They find that the spinal cord and brain of every animal which they have investigated possess definite antitoxic properties in respect of the tetanus toxin; furthermore, they can protect if injected in the form of emulsion twenty-four hours before the toxin, and can save life when inoculated many hours after it. The first clinical application of these views appears to have been made by Babes, who, in the course of a paper on Ehrlich and Wassermann’s work, read before the Bucharest Scientific Society, incidentally mentions that he had administered extracts of the central nervous system in cases of tetanus with satisfactory results. The question has since then been taken up, no doubt independently, by Dr. Anton Krokiewicz of Krakau, Poland (*Wiener klin. Wochensch.* Vol. XI, page 793), whose paper has a special value in that it compares the old with the new methods of treatment under almost experimental conditions. It happened that Dr. Krokiewicz had in July of this year two cases of tetanus in his wards almost simultaneously; the one was treated with antitoxin, the other with a fresh emulsion of the brain of a calf. There was but little difference in the virulence of the cases, for whereas in the former (a man) the incubation period was shorter and the disease in consequence more acute, in the latter (a woman) there was more marked trismus, with consequent difficulty in feeding, and the general condition was much less good. The course under treatment was very different in the two patients. In the woman, two injections of brain emulsion representing in all about $\frac{1}{2}$ oz. of brain substance, effected a complete cure in eleven days, with no ill-effect other than the formation of two small abscesses at the seat of the second injection which was somewhat too concentrated. The man, on the other hand, received four doses of antitoxin (1 in 10,000) amounting in all to 196 c.cm., and yet was not cured for eighteen days. Furthermore the brain emulsion produced an almost immediate alleviation of the tetanic symptoms so that the patient begged to have the injection repeated; the administration of the antitoxin, on the other hand, was followed by severe paroxysms, sleeplessness, fever, and a sense of dread which allowed it to be repeated only under the pressure of dire necessity. Although too much must

not be based on the result of a single case, it seems that the injection of brain emulsion may prove to be a valuable remedy in tetanus; the latest statistics of the use of the antitoxin show 11 deaths in 22 cases (Dr. Sigmund Erdheim, *Wiener klin. Wochensch.* Vol. XI, page 463)."

In any event a line of treatment has been opened up which may lead into a field of which it is at present impossible to define the limit.

Koch's investigation of the Rinderpest for the Cape Colony government apparently has not met with the approval looked for.

In regard to the progress with the Antitoxin treatment of pneumonia, Dr. Andrew H. Smith of New York has summed up the general verdict in a paper read before the Association of American Physicians in May last (*Amer. Journ. of the Medical Sciences* Vol. CXVI, page 377) as follows: "We cannot avoid the conclusion, from this résumé of the achievements of serotherapy in its application to pneumonia, that up to the present time they can scarcely be said to amount to more than an encouragement to further effort. No really decisive results have been obtained."

There does not seem to be any very definitely favorable results in the treatment of leprosy during the past year by Antileprosy serum.

Dr. Holger Mygind of Copenhagen, Denmark, has written an article on the "Treatment of Ozæna by Antidiphtheritic Serum" in which he describes 10 cases by subcutaneous injection. He concludes that this form of treatment is the most effective yet known for ozæna. His mind is not yet made up as to what it is in the serum which produces the desired effect, but he proposes to continue his observations still further although he is quite satisfied it is not due to the toxins present (*Journ. of Laryngol., Rhinol., and Otol.*, Vol. XIII, page 379).

Little encouragement is given from experiments with the serum treatment of syphilis, but many are still working in this line.

Dr. E. J. Frantzius has made some investigations for the purpose of finding an Antitoxin for rabies. He has discovered that the bile from an animal affected with rabies contained an Antitoxin far more potent than any yet described (*Centralblat. für Bacteriol.* Vol. XXIII, page 782).

Dr. J. Lindsay Porteous of Yonkers, N. Y., has recommended the administration of Antitoxin by the mouth in particular cases. He relates some of his cases which are of interest. He is not aware that this mode of administration has ever been tried before and he

states that his object in writing the present article, is to prove that the Antitoxin of diphtheria is not rendered inert by changes in the stomach, and that this is an easy method of giving it to nervous children (*N. Y. Med. Record* Vol. 52, page 919).

Dr. C. Fisch of St. Louis, Mo., also advocates administration by the mouth and has written a paper entitled "Some Experiments on the Assimilation of Diphtheria Antitoxine" and read it before the Bethesda Pædiatric Society in February last. He concludes as follows :

"I need not state *in extenso* the conclusions that it will be allowed to draw from these remarks. It seems, in the first place, that they tend to corroborate the theory of the chemical nature of antitoxine, and in the second place they show that with perfect safety immunization against diphtheria may be produced by oral administration of the antitoxic serum or the antitoxic milk. In the case of children the latter seems preferable. On the other hand they emphasize the fact that curative effects must not be attempted by this way of administration on account of the slowness of absorption, or at least of diffusion through the system ; even for prophylactic purposes (in families where one member is infected, for instance) it must be employed only with careful discrimination of the conditions.

For speculative minds it would be a promising task to find out why it takes so long for this substance to be diffused through the body, while almost all other absorbable chemical bodies, when in contact with the intestinal mucous membrane, assert their presence in the circulation much earlier." (*N. Y. Med. Journ.* Vol. LXVII, page 489).

Rectal injections of the various serums are still undertaken, and it might naturally be inferred that if success is obtained through the upper part of the alimentary tract, it might be expected in the lower part.

For those who are interested in tabulating the cases of poisoning by Antitoxin it may be well to record here that Dr. John Lovett Morse of Boston, Mass., read an account of a case at a meeting of the Clinical Section of the Suffolk District Medical Society in November last (*Boston Med. and Surg. Journ.* Vol. CXXXVIII, page 156).

Anusol, claimed to be the Bismuth salt of Iodo-Resorein-Sulphuric Acid, has not been mentioned in the current medical literature of the year.

Anytin is the interesting new substance which apparently was some time ago discovered by Helmers and now revived on account of the important group of oily bodies recently prepared from it, and the results of the examination of which in the hands of Dr. F. Loeffler of the University of Greifswald, Prussia, led to his writing a paper on the subject, which has appeared in the *Deut. Medicin. Wochensch.* (Vol. XXIV, page 149). It is prepared as follows: Any of the hydrocarbons containing about 10 per cent. of sulphur are treated with concentrated sulphuric acid, then neutralized with ammonia and the insoluble portion in water precipitated by alcohol. The product (called Anytin) thus obtained possesses a very great solvent action on bodies ordinarily insoluble in water. The preparations made by dissolving such substances insoluble in water in Anytin have been called Anytols. The hydrocarbons that have been used consisted generally of mineral and resin oils, although others have been employed. It is quite reasonable to conceive that this very remarkable property possessed by Anytin opens a new field not only in medicine but other branches of science. When perfectly dry this article is in the form of a powder, brownish-black in color and very hygroscopic. It contains 16.5 per cent. of sulphur and 4.5 per cent. of ammonia. As one would naturally suppose, quite a list of the Anytols have already been made out. A few only will be mentioned here. Thus Phenol converted into soluble form by means of Anytin is called Phenol-anytol; Cresol would form Cresol-anytol (found to contain 50 per cent. of Cresols). Creosote-anytol is found to contain 40 per cent. Creosote and 60 per cent. Anytin. Guaiacol-anytol is found to contain 40 per cent. Guaiacol and 60 per cent. Anytin. Eucalyptol-anytol is found to contain 25 per cent. Eucalyptol and 75 per cent. Anytin. Wintergreen-anytol is found to contain 20 per cent. Wintergreen Oil and 80 per cent. Anytin.

A somewhat extended series of experiments was at once conducted with a view to determine what bactericidal power these compounds possessed. It was found that Anytin itself behaved in a similar manner to Ichthyol. Anytin, however, appeared to act more energetically against diphtheria streptococcus than Ichthyol, but less active against other forms of bacteria. The Anytols of various disinfecting substances were tried with very gratifying results, showing a great superiority in the action of the Anytols over the action of the disinfecting substances themselves. For instance Meta-Cresol-anytol (containing 40 per cent. Meta-Cresol) will prevent

the coagulation of albumin on boiling. Catgut treated with a 10 per cent. solution of this latter Anytol does not appear to be damaged in any way. The skin is hardly affected by a solution of this Meta-Cresol-anytol up to 3 per cent. in strength, and a 1 per cent. solution has no effect upon the skin. It is well known that a 3 per cent. carbolic acid solution, which in that strength would be inferior in action, has its definite effect on many skins. Therefore the value of this Anytol for disinfecting the hands was definitely proven. Again it acts very effectively on all infected wounds, and on cotton-wool used as plugs in the nostrils in treating ozæna. The uterine cervical mucous membrane and the mucous surfaces of the vaginal and male urinary tract do not show any irritation after the application of a 1 per cent. solution. From the favorable results obtained by using Ichthyol in chyluria, it would be in order to try this Meta-Cresol-anytol with the expectation of even more favorable results. Investigations are being continued on certain other pathological conditions with promising results, and the whole series of compounds are certainly of great therapeutical interest.

Apolysin—the combination of Phenetidin and Citric Acid—has not appeared before the medical profession in print for the past year.

Argentamin (Ethylene-Diamin-Silver Phosphate)—the Silver Nitrate substitute—has received little special attention during the past year although it is still in use by the genito-urinary practitioners. It has, however, during the last few years been used in ophthalmic practice. Dr. Moor has made a report of his cases which have now extended over several years and amount in all to 328, which include all classes of conjunctival affections as they appeared in his clinic. He found that it was superior to Silver Nitrate as being less irritating, penetrating much deeper and being more powerfully antiseptic. His custom was to either drop a 5 per cent. aqueous solution into the eye twice a day or paint it on the surface. He frequently applied it oftener. He calls attention to the fact that any black stains occurring from its use may be readily removed by the use of potassium iodide.

Argentol, the new antiseptic combination of Oxy-Quinolin and metallic Silver, has not appeared to take its place as a substitute for Actol and Itrol as recommended last year, for little has been heard of it.

Argonin, the bactericide formed by mixing Silver Nitrate with a combination of Sodium and Casein, continues to occupy a

prominent place before the medical profession. Dr. Horace Bigelow of New York reported at a meeting of the Society of the Alumni of Bellevue Hospital on January 5th last, a series of cases of ophthalmia treated with this agent.

“ He said that his cases had not done well under the usual methods of treatment—*e. g.*, cold applications and the use of nitrate of silver. The former was disagreeable to the patient, and required the constant care of a nurse. The second method was painful and tedious. For some months past, in the children’s ward of Bellevue Hospital, he had been using argonin, a plan of treatment that had been introduced there by Dr. E. L. Dow. Thirteen cases of purulent ophthalmia in infants had been so treated. Three of these, developing in foundlings in the wards, had been treated in this way from the earliest time of the inflammation, and had been cured in seven days. In the other cases, the average duration had been thirteen days. The first case subjected to the treatment had previously resisted the usual methods, but had quickly improved under the use of argonin. A carefully prepared three-per-cent. solution of argonin had been used. A minim dropper having been inserted deep under the eyelid, enough of the solution should be instilled to thoroughly irrigate the eyelids twice and, later, once in the twenty-four hours. Between these applications the lids were kept constantly clean with boric-acid solution. Fifteen grains of argonin contained as much silver as a grain of the silver nitrate. It was a white, amorphous powder, easily soluble in warm water. It was not irritating, and it formed no slough on contact with the mucous membrane, and, therefore, no neutralizing agent was required after its use. From his experience with argonin in these cases, Dr. Bigelow had concluded that it was a very valuable agent in the treatment of purulent ophthalmia, because of its mild but thorough and rapid curative action.”

Some discussion followed and Dr. Bigelow closed it with the statement that the diminished irritation and danger were the chief advantages of the Argonin treatment (*N. Y. Med. Journ.* Vol. LXVII, page 504).

The writer begs leave to suggest that the marked irritation frequently following the use of silver nitrate may probably be due to the use of the ordinary crystalline silver nitrate which is often found to be slightly acid, whereas if on the delicate, sensitive tissues like those of the eye, a solution of the moulded silver nitrate of the U. S. P. be employed, far less irritation and dangerous effects

will be observed. This fact has been proved in more than one case, and repeated observations are invited.

Drs. Frank Gray and William R. Thompson have reported on "Argonin vs. Boric Acid in Acute Suppuration of the Middle Ear" (*Texas Courier-Record of Medicine* Vol. XV, page 411) in which the following conclusions are drawn :

"1. Argonin solution is highly antiseptic ; boric acid, if at all, very slightly so.

"2. Argonin in solution can be forced through a small perforation in the drum-head, thus reaching every part of the tympanic and eustachian tube. In such a case boric acid lies inactive in the external auditory canal.

"3. Argonin can be used to flush the middle ear and tube, thus reaching every part of the inflamed tract, carrying out with it all products of inflammation and speedily relieving the attendant fever and pain.

"4. Argonin exerts a positive and decided effect upon the suppurative process. Boric acid possesses this power but feebly.

"5. Argonin stimulates the closing of perforations in the drum-head. Boric acid has no such action.

"To obtain this effect, it is, of course, necessary that the solution ($\frac{2}{5}$ per cent.) should pass *through* the middle ear, in order that it may be brought into contact with *all* the tympanic membrane. This is usually not difficult. Having cleansed the canal in the usual manner, say with carbolyzed water, or solution of hydrogen peroxide, the drum cavity is to be emptied by Valsalva's method, or by the Politzer bag, and the secretion thus blown out removed with the cotton carrier. The auditory canal is then filled with the argonin solution and covering the outer end of the canal with the tragus, at the same time making strong pressure upon it, the solution is forced through the perforation into the middle ear, thence to the throat by way of the eustachian tube. The application is entirely painless."

Dr. Niessen, in the course of his comparative experiments with some new substitutes for Silver Nitrate in the treatment of gonorrhea, reports in regard to this agent that it undoubtedly influences the growth of the gonococcus although less in effect than Silver Nitrate. It has, however, the very distinct advantage of being quite unirritating.

Dr. Stark of Thorn, West Prussia, has reported that a much prompter and more effective action in gonorrhea is secured by

combining this agent with Potassium Permanganate. He reports that if the urethra be rinsed daily with a solution of Potassium Permanganate the tissues are softened and the penetration of the Argonin is favored. This latter is injected in the form of a 2 per cent. solution three times a day, with marked good effect under these conditions.

Aristol (Amidalin) need hardly be called to the attention of practitioners generally, for its use is quite universal. However it may be of interest to some to read an article entitled "Scalds and Burns" by Dr. J. Abbott Cantrell, published in *The Monthly Cyclopedia of Practical Medicine and Universal Medical Journal* for May, 1898 (Vol. I, new series, page 192), in which he speaks of Aristol among other agents as presenting the advantage of being useful in burns of the second and third degrees where other remedies have failed. He apparently verifies Dr. Sidney V. Haas' statement that the pain is almost instantly relieved and that healing is rapid.

Bananina has not been heard of under this name during the past year, but the use of Bananas has met with some attention. Dr. Wm. C. Ussery of St. Louis, Mo., has called attention to the fact that they are an excellent food for typhoid fever patients, for the reason that there is such a small part of excrementitious matter in their composition that they do not irritate the ulcerative condition of the mucous membrane of the intestines. Almost the entire amount of the fruit as eaten is at once absorbed as nutritive material.

As is well-known to the medical profession Dr. Robert Koch of Berlin, Germany, has been pushing his investigations into the cause of the East African plague, and in his report last July to the German Society for Public Hygiene, he made some very odd statements about several points, one of which was that the banana and banana plantations were the breeding grounds and the means by which this plague is spread. This is evidently very odd reasoning, for it is well-known that the plague exists in countries where the Banana is unknown and also the plague is unknown in many sections of the world where the Banana enters so largely into the daily food of the inhabitants. Such a statement as this is in keeping with another of his statements, that the plague will not survive the advance of civilization. He apparently does not consider what this word civilization includes now-a-days, for unless counteracting influences were brought to bear, one element alone of the progress of

civilization—that of the introduction of railway transportation—would tend to spread the disease and would rapidly disseminate it throughout soil ready to receive it.

Benzonaphthol (β -Naphthol Benzoate)—the intestinal antiseptic—has undoubtedly been made use of throughout the past year by many practitioners, but little mention has appeared in the medical literature. One article, however, may be noted here, and that is an original communication contributed by the *Western Medical and Surgical Gazette* (Vol. I, page 203) on “The Treatment of Chronic Enteritis” by Dr. E. P. Hershey of Denver, Colo., in which he mentions several agents having been employed by him with some effect, but he concludes that this agent if given in 6 gramme (about $1\frac{1}{2}$ drachm) doses in the 24 hours, is the ideal remedy for intestinal fermentation, and, what is quite important, that this large quantity is not injurious if not too long continued. His conclusions are as follows :

“Chronic enteritis is an affection impossible to overcome just so long as irritation continues. This irritation is due mainly to fermentative changes brought about by pathological conditions in the intestinal glands resulting in vitiated secretions. The prevention of excessive fermentation takes away the irritation and allows the uninterrupted restoration of the glands affected. This result is best accomplished by means of a remedy that will act locally upon the glands and will prevent excessive fermentation.

The two best-known remedies for this purpose are benzonaphthol and the bismuth salt of tetra-iodo-phenol-phthalein, the latter having the advantage over the former, that it persists in being a local remedy in the intestinal canal, whereas the former, though acting locally, liberates benzoic acid in sufficient quantities to become sooner or later a renal irritant.”

Benzosol (Benzoyl Guaiacol)—another recommended intestinal antiseptic—has not been much alluded to during the past year. It has however been one of several agents used in the internal treatment of rheumatoid arthritis.

“Dr. Gilbert A. Baumatyne has latterly experienced a change of belief in regard to the relief and curability of this disease. Assigning a micro-organism as the cause of it, and failing an antitoxin, he has employed drugs which possess high eliminative powers and which have been found useful in other microbic conditions. These he has sought for in the phenol group of antiseptics, and particularly creosote or some of its compounds or derivatives. Creosote

and guaiacol have been abandoned because they produce great intestinal irritation, are caustic and coagulate albumin. In their place he employs creosote carbonate, guaiacol carbonate, and benzosol; none of these are caustic, and absorption takes place gradually from the intestines" (*Edinburgh Med. Journ.* Vol. III, new series, page 60).

Doses of 260 milligrammes (4 grains) three times daily he found could be increased to six times that amount, but it was found to be feebler in action than the Guaiacol Carbonate. He found that apparently all these agents act locally on the alimentary canal before absorption and afterward by favoring the elimination of the toxic albumins with which they combine.

Bismutan is the coined name for a compound resulting from the mixture of Bismuth, Resorcin and Tannin. This combination has been in use before, but it was not deemed necessary to have a name adopted for such a mixture. It forms a bright-yellow powder quite odorless, slightly sweet in taste and insoluble in water. It is being compounded in Zürich, Switzerland. It is recommended for the treatment of diarrhea in children, producing good effects in 24 hours.

Borol has been practically unheard of during the past year throughout the prominent current medical literature.

Bromoform seems to be gaining in its reputation particularly in the treatment of pertussis. It still shows unfortunate behavior at times, and therefore some care is yet necessary in using it. Dr. A. Marfan of France states that on the whole it is the best remedy for this affection known at this time. He admits, however, that it fails in its action occasionally, but in such cases he finds an efficient mixture in Antipyrin, Belladonna and Syrup of Tolu. In the use of Bromoform he reports having in a few cases reduced the duration of the attack to three weeks, and he almost invariably loosened the cough when using it. Such symptoms as diarrhea, vomiting and even drowsiness should not necessarily discourage the practitioner.

There are still many practitioners who consider it a dangerous agent and poisoning cases are still reported. One of special interest is of Dr. Müller of Munich, Bavaria, for he was enabled to obtain an autopsy (*Muench. Medicin. Wochensch.* Vol. XLV, page 1211).

Camphor is still an article of great importance to the medical profession as well as for technical purposes, and as mentioned here for several years past, its scarcity is becoming a serious matter. It

will be interesting therefore to note that the artificial manufacture of this article has now become quite an established fact, for the process, which has now been perfected and patented by a set of capitalists, assures a much finer article than the previous artificial productions. The time is not quite ripe for spreading this upon the market, but from promises now made, many months will not elapse before very definite evidence will be brought forth.

Little special attention has been paid in the literature to Camphor. However a communication may be worth recording here which was addressed to the *British Medical Journal* (Vol. II for 1898, page 84) by Mr. W. H. Spurgin of Newcastle-on-Tyne, England, in which he calls attention to "The Camphor Habit and its Dangers."

A Naphtol compound of Camphor has been announced although no special clinical reports have been made of its use. It takes the form of 1 part Naphtol in fine powder and 2 parts Camphor. The mixture is warmed gently until a homogeneous liquid is obtained. It is then filtered and preserved in well-stoppered *yellow* glass bottles.

Camphoroxol is the compounded name given to a mixture of 1 per cent. of Camphor and 3 per cent. Solution of Hydrogen Dioxide which is offered as a powerful germicide. To this is added 32 per cent. of alcohol to form the complete mixture.

Dr. Wagner of the Charité Hospital, Berlin, reports on his use of a 10 per cent. solution of this agent in the treatment of abscesses and suppurating wounds. When the abscess is opened it is recommended to irrigate with this solution and place a pad of cotton moistened with it over the surface—kept in place by a bandage. This dressing is renewed every second day. It appears that all purulent discharges rapidly cease, resulting in healthy granulation. It acts as a deodorizer and is entirely free from any irritation. It appeared to be especially effective in mastitis. Anthrax spores, according to the investigation of Dr. Beck, are killed within three hours which does not occur when either Camphor or Hydrogen Dioxide are used by themselves. The alcohol solution appears to keep well and the recorded surgical cases now amount to 200 in all, in which sterilized gauze was used.

Allied mixtures, which will be alluded to in proper alphabetical order, are Menthoxol and Naphthoxol (*Deut. Medicin. Wochensch.*, Vol. XXIII Therap. Beilage, page 74).

Captol is the name given to a proprietary preparation consisting of a condensation product of Tannin and Chloral. It appears

as a dark brown hygroscopic powder, difficultly soluble in cold but rapidly in warm water and in alcohol, but decomposed by alkalis—unaffected by acids. Upon analysis it is reported to contain not only the constituents stated, but small quantities of Resorcin and Salicylic Acid.

Dr. P. J. Eichhoff of Elberfeld, Rhenish Prussia, has reported his experience with this mixture. He notes that it combines the astringent action of Tannin with the antiparasitic action of Chloral. He has made use of it in the form of a 1 or 2 per cent. solution in alcohol as a lotion for the treatment of schorrhea, applied twice a day. It seems to act with none of the disadvantages of the two ingredients used separately. It acts effectually also in preventing the formation of dandruff, in reducing the secretions of the sebaceous glands and in preventing premature baldness. He found that it apparently possessed no disadvantages whatever and acts well as a prophylactic. It has an agreeable odor and therefore is not unattractive to women (*Deut. Medicin. Wochensch.* Vol. XXIII, Therap. Beilage, pages 68 and 78).

Chinaphtol (Quinine β -Naphtol- α -Mono-Sulphonate), formed by combining Quinine and β -Naphtol and recommended last year as a new intestinal antiseptic, has not been heard of during the year past in the current medical literature. The reports of last year from hospitals and private practice in typhoid fever and dysentery have either not been as favorable this year or they have been so disappointing that the agent has been dropped.

Chinosol, the antiseptic, disinfectant, deodorizer and bactericide is still before the medical profession, but particularly before the veterinary profession. Dr. F. Hobday of the Royal Veterinary College of London, England, discusses the therapeutic and toxicological effects of this agent. He has made extensive use of it during the previous nine months both in his canine and equine clinic. It was used as an antiseptic on wounds of all kinds, in the form of solutions varying from 1 in 60 to 1 in 1200 with most satisfactory results. The strength found to give the best results was from 32 to 65 milligrammes ($\frac{1}{2}$ to 1 grain) to 30 Cc. (1 fluidounce). Upon fetid and ulcerating wounds a proportion of 1 in 480 speedily caused a healthy appearance and entire absence of pus after applications made once or twice per day. In treating wounds in different parts of the same animal, opportunities were often gained to note the effects of the solution of this strength in comparison with those of Lysol and Creolin with the result that Chinosol gave

decidedly the best results. As a dry dressing in the form of powder when mixed with either Boric Acid, Zinc Oxide or Starch and then compared with Iodoform used in a similar manner, the sequelæ appeared to be about the same. As a disinfectant to the hands, skin and suture threads, a solution was used varying from 1 to 1000 to 1 in 60 without any signs of irritation either to the hands of the operator or the skin of the patient. Care must be taken, however, with instruments, as on several occasions Dr. Hobday reports that the instruments lost their edge and the steel parts became coated with greenish-black spots which were troublesome to remove, and in those instruments which had white bone handles the latter became discolored and rough to the touch. The solution therefore recommended for such purposes consists of 1 in 1200 and if the instruments are to remain in it for anything like an hour, this strength should certainly not be exceeded. As a deodorizer for the hands or for fetid wounds, solutions of the same strength as those used for disinfectant purposes act satisfactorily. Details of several illustrative cases were related and the author sums up the conclusions to which his experience has led him as follows :

“(1) That chinisol acts well as an antiseptic, disinfectant and deodorant when used in certain proportions. (2) That its action is better marked when used as a lotion than when used as a powder. (3) That the powder is not suitable for use on fresh wounds unless diluted in some way or other. (4) That for the disinfection of instruments care must be taken not to make the solution too concentrated. (5) That the drug possesses toxic properties. (6) That if used subcutaneously in too concentrated a form it will produce local irritation and swelling. The strength recommended for subcutaneous injection in human practice is from 1 in 600 to 1 in 200. (7) That the cat is very susceptible to its action, and that in this animal much more care is necessary to guard against toxic symptoms than in the case of the dog. In the cat, if subcutaneously injected, the extreme limit of dose should be one-sixteenth of a grain for each pound body weight, and in the dog one-eighth of a grain per lb. (8) That chinisol is not rapidly absorbed from the unbroken skin of the dog, and can be applied for several days in succession even in fairly concentrated solutions to the skin of this animal without producing eruptions or sores. (9) That the chief symptoms of poisoning are: Sneezing and coughing, an increased flow of thick ropy saliva, subnormal temperature, staggering gait commencing with loss of motor power in the hind quarters, great

prostration, and ultimately death from failure of the heart's action. (10) That the chief *post-mortem* characteristic is the smell of chinol on or in some part of the body; whilst another symptom to be looked for is the presence of frothy saliva in the pharynx, œsophagus, or stomach." (*Epitome of Brit. Med. Journ.*, Vol. I for 1898, page 91).

To aid those who would desire to look up the whole subject in review, it may be of advantage to mention here that a year ago Dr. A. G. Cipriani of Cagliari, Italy, wrote quite extensively on its internal administration in human subjects and recorded his results in the *Allgemeine Medicin. Central-Zeitung* (Vol. 66, page 953) where he stated that rapid and apparently permanent improvement resulted from the administration of this agent both by the mouth and injected locally for the treatment of tuberculosis.

Mr. Alfred Clark of Cerne House, Leicester, England, reports in a letter to the Editors of the London *Lancet* that he has used it regularly and almost exclusively in operative and general surgery, and in mid-wifery practice. He has always found it a most reliable and efficient antiseptic, with the advantage over Carbolic Acid and Perchloride of Iron that it does not irritate the skin, but with the one drawback that it stains the instruments (London *Lancet* Vol. I for 1898, page 835).

Chinoval is the coined name for a combination of Quinine and Chloral introduced by a German chemist as an antiseptic equal in potency to Mercuric Chloride. It is spoken of as a *compound* of an oily consistency, but there are evidences to more than conjecture that it is simply a mixture of Quinine Sulphate and Chloral Hydrate.

Chloralose (Anhydro-Gluco-Chloral)—the hypnotic—continues to be used with little abatement, but it has not been commented upon specially under its own head throughout the medical literature of the year.

Chlor-Phenols (Mono-and Para-Chlorphenol) have not been found worth special mention in the medical literature of the year. What little did appear last year had relation more particularly to the Mono Compound. In relation to the Para Compound Dr. Dentu has taken pains to review the statements of Girard relating to its toxicity and antiseptic properties. Dr. Dentu finds that it is much more toxic than was reported by Girard—the poisonous dose being 250 to 260 milligrammes (about $3\frac{1}{2}$ to 4 grains) per kilogramme (about $2\frac{1}{4}$ pounds), while Girard gave one gramme (15.4 grains) per

kilogramme. He calls attention to its rapid absorption and making itself evident by darkening the urine, therefore its employment requires careful watching, but under certain conditions it is to be preferred to Carbolic Acid.

Citrophen (Phenetidin Citrate) has been unheard of in the prominent medical literature of the past year.

Cocaine and its salts, but particularly the Hydrochlorate, hold their own very firmly in the estimation of the medical profession. The very evident straining, however, on the part of manufacturers for absolute purity, which is to be commended on general principles, has evidently led many of those manufacturers as well as the practitioners themselves into a misconception of their needs in relation to the therapeutic effects looked for. This misconception prevails in relation to many other medicaments besides Cocaine, but to speak now in direct relation to Cocaine Hydrochlorate which is under comment here, it is well to bear in mind that the evidences have now become quite conclusive that the best effects are obtained when the whole of the ether-soluble products of the crude Cocaine are made use of, rather than when the attempt is made to carefully isolate only what is called Cocaine. Careful comparative experiments have now accumulated in such numbers as should convince the careful observer that if the crude Cocaine is simply washed with pure Ether and the salt made from what remains after evaporating the Ether, the efficient agent is obtained for local anaesthesia. The pure crystals offered by many manufacturers are no doubt very attractive, and as stated above should be approved of on general principles, for any leaning towards purity should be encouraged rather than discouraged. However when better results are obtained by a different process, the question must be looked at in a different light.

At the recent meeting of the Section of Ophthalmology of the British Medical Association, Dr. Adolph Bronner of Bradford, England, read a paper on "Crystals of Cocaine in Preference to Solution." An abstract of this paper appears in the *British Medical Journal* (Vol. II for 1898, page 490) in which he states:

"In most operations on the eyeball we use a 2½ per cent. solution applied several times. In strabismus operations a 2 to 10 per cent. solution is often injected under the conjunctiva. Toxic effects are apt to follow, and the distension alters the parts and renders operation more difficult. For most operations on the conjunctiva I use cocaine crystals in preference to the solution. For deep

operations, such as iridectomy in glaucoma and extraction of cataracts, the crystals are much more efficacious than the solution. The pain is less and there is less tendency to spasm of the ocular muscles and consequent loss of vitreous and prolapse of iris. About $\frac{1}{4}$ gr. of the hydrochloride of cocaine is applied to the corneo-scleral junction where the incision is to be made. The eyelids are kept open for a few seconds, then closed four to five minutes. I also use the crystals in ulcer of the cornea and when using the galvano-cautery. In tenotomies or advancements the operation is rendered painless by the use of cocaine crystals. I have also used them in several cases of enucleation. As the crystals cause a severe burning pain, it is first necessary to apply a weak solution. I have never seen any toxic effects. Some allege that a $2\frac{1}{2}$ per cent. solution induces complete anæsthesia, and that no better results can be obtained by a stronger solution or by crystals. This has not been my experience, and I have brought the subject forward in the hope of obtaining the opinion of others who have tried the different strengths of cocaine solutions and the crystals."

In the discussion which followed, the following points were brought out :

Mr. Marcus Gunn pointed out that a weak solution of Cocaine was necessary before using the crystals. The crystals caused pain at first, and might also produce local ulceration. For some reasons, then, a strong solution was to be preferred to the crystals.

Dr. McGillivray said that in America suprarenal capsule was given to aid the action of Cocaine. He had tried it himself, first, in a case of absolute glaucoma, in which chloroform could not be given ; the result had been very good. He dropped a weak solution into the conjunctival sac alternately with Cocaine.

Dr. Reeve (Toronto) said that suprarenal extract had the great advantage of acting as a styptic, hæmorrhage was almost entirely prevented by its use.

Dr. Bronner, in reply, said that after insertion of a crystal of Cocaine the lids should be held apart for a time.

Dr. Samuel Theobald of Baltimore, Md., has deemed it timely to write a word of warning about the too free use of Cocaine in the treatment of diseases of the eye (*Bulletin of the Johns Hopkins Hospital*, Vol. IX, page 193). He enumerates three cases and concludes with the following paragraph :

"I have thought it worth while to report these typical cases, because I am sure that it is getting to be a very common thing for the

general practitioner to prescribe cocaine indiscriminately in eye diseases, and, as I feel that its field of usefulness is so limited, a word of warning upon this point seemed to me not amiss."

A paper was read at the Orleans Parish Medical Society in May last on "The Abuse and Dangers of Cocaine" by Dr. W. Scheppegrell of New Orleans, La. (*Medical News* Vol. LXXIII, page 417). He closes with the following very pertinent and timely remarks:

"In the majority of cases in which the cocaine habit is established a prescription of the physician is responsible for the evils which result. When such a remedy is placed in the hands of a patient for an ordinary coryza, hay-fever, and many other conditions in which there is transient or only apparent benefit from its use, the habit is easily contracted, and many druggists, unfortunately, are prepared to supply all of the deadly drug that the patient may demand. In view of these considerations, the rule has a substantial foundation that cocaine should never, under any circumstances, be prescribed for the patient's use, and above all, for the nasal cavities, where the application is made with such facility and from which many of the most severe cases have resulted.

A peculiar phase of the cocaine habit which has developed in New Orleans and in a number of other cities in the South is the contraction of this habit by the negroes. The extent to which this has spread can be easily verified by druggists and in police circles. It is not used in the manner generally prescribed, but a few crystals of the drug are snuffed into the nostrils, not on account of its contractile effects on the nasal mucosa, as is usually the origin of this habit in the Caucasian, as the nasal passages of the negro are normally quite patulous, but on account of its exhilarating effects. The physical and mental wrecks which soon result from this vicious habit attest to its pernicious effects.

While admitting the danger and evil results of the abuse of this drug, we should not, on the other hand, go to the extreme in condemning it in its entirety, as has recently been done on several occasions. That this should be the case, however, is not unnatural, being the return swing of the pendulum of the early enthusiasm with regard to it. What is needed is that one should have a proper realization not only of the benefit but also of the danger of its application. The medical profession should be made thoroughly acquainted with the complications which may arise from the use of cocaine, and the evil of placing such an agent in the hands of a patient. The druggist should be compelled to restrict the sale of this as well as

of other toxic drugs to the prescription of the physician. As stated before, however, cocain should never be placed in the hands of the patient under any circumstances, as the habit is so easily acquired. In this manner we may retain the use of a valuable drug, and, by exercising proper care, eliminate its evil effects."

Then followed a carefully prepared list of 44 references in the form of a bibliography.

A correspondent to *Nature* writes (Vol. 58, page 435) that it might be of interest to know that Cocaine is a remedy for wasp and bee stings. It acts apparently not only as a temporary local anæsthetic, but seems also to have the power of destroying the poison of the sting. He used Cocaine tabloids hypodermically upon a lady who was badly stung by a wasp. This lady apparently was very susceptible and such stings had considerable systematic effect upon her, not only producing a very large and painful swelling, but making her feel more or less unwell for two or three days. One tabloid dissolved in a few drops of water, and applied with the finger at once, almost removed the pain; a second, applied an hour or two after, completed the cure. A few days later he found the Cocaine equally effective in the case of a young girl who had been severely stung. Since then he has kept a small bottle of a strong solution of Cocaine ready for use, and it has always proved effective. It should, of course, be applied as soon as possible, but he found that it gave great relief seven or eight hours after the sting, even though the solution had been kept for two years.

Cosaprin, closely allied chemically to Acetanilid,—one of the newest antipyretic agents of last year—has been unheard of in the year past. Only meager data was given last year and apparently nothing has been added during the year past.

Creosotal (so-called Creosote Carbonate) has apparently started up somewhat from apparent obscurity during the past year and has been noted more frequently in the medical literature.

"Dr. Nordt has published full details of the very favourable results obtained by Professor von Leyden, of Berlin, in the treatment of phthisis by creosotal. The medicine was given in gradually increasing doses commencing with five drops three times a day and three drops being added daily until the quantity of twenty-five drops three times a day was reached. This dose was continued for a period varying from one to four weeks, after which the quantity was reduced and increased again. The night-sweats and fever of phthisis obviously became less under creosotal, while from week

to week the bronchial secretion and cough were perceptibly diminished and the physical symptoms of phthisis disappeared completely in two cases in which the treatment had been continued for eight months and ten months respectively. Creosotal is perfectly free from the disadvantage of creosote, no unfavourable effects on the stomach or intestines having been observed in any case." (London *Lancet*, Vol. II for 1897, page 1472).

Dr. Hugo Goldmann of Brennborg near Oedenburg, Hungary, has had some experience in the use of this agent and has published his results in a paper entitled "The Treatment of Tuberculosis of the Lungs by Creosote Carbonate and Ammonium Sulpho-ichthyolate." He finds the following formula agreeable to patients, and therefore does not hesitate to recommend its use :

Creosote Carbonate...	15 grammes (about 4 drachms)				
Ammonium Sulpho-					
ichthyolate	15	"	(	"	4 ")
Glycerin.....	30	"	(	"	1 ounce)
Peppermint Water...	10	"	(	"	3 drachms)

The dose is from 10 to 30 drops given three times a day in a little wine. His very significant remark that he has found gratifying success among the peasants in agricultural and mining districts, where hygienic influences and fresh air are important elements furnished in the treatment, is in keeping with the observations made by most careful observers now-a-days when pulmonary tuberculosis is treated. Cases of advanced tuberculosis with evidence of cavities being present do not respond to this agent or any other, in his experience (*Wien. klin. Wochens.*, Vol. XI, page 817).

Dr. Edmond Chaumier of Tours, France, has recently written on "Creosote and Some of its Derivatives" (London *Lancet*, Vol. I for 1898, page 222) and in treating of several of the derivatives speaks as follows about Creosotal :

"So recently as 1892 creasotal was still considered a curiosity of the laboratory. Its existence was communicated to me by one of my friends, an expert in chemistry, at a time when I was endeavouring to find a remedy for phthisis easily administered to children. Creosotal being a neutral carbonate of creosote, I assumed that it might be found useful, but I had great trouble in procuring it, and only after a long correspondence with Dr. Von Heyden, in whose laboratory it had been discovered, the latter agreed to have some creasotal made for my experiments. As soon as I had carried out my tests I

made it known that creasotal was destined to supersede creasote and my prediction is now almost an accomplished fact. The result of my researches has been communicated to the Academy of Medicine, the Congress of Tuberculosis, the Association for the Advancement of Science and the International Medical Congress at Rome. In every country my experience has been put to the test and numerous observations by physicians have been published everywhere. They all agree that creasotal is a medicament as efficacious in the treatment of tuberculosis as creasote but without the latter's objectionable qualities. Like creasote it increases the appetite, diminishes the cough, facilitates nutrition, and stimulates the increase in weight. Its advantages over creasote are that it can be used indefinitely without causing any gastro-intestinal troubles.

Creasotal is a compound in the form of a carbonate of all the substances found in creasote. In the digestive organs, and particularly in the intestines, it splits up into creasote and carbonic acid. This process takes place slowly and the creasote set free is absorbed, as and when generated over the whole length of the intestinal canal. On account of this property creasotal should be given as an intestinal antiseptic in cases of typhoid and puerperal fevers. Creasotal is a viscous liquid, which, however, can be made fluid by means of a hot-water bath. It has a very slight tarry taste; its oiliness is too slight to form an objection. When weak doses are required it can be given in the form of capsules of seven and a half grains. I myself, however, prefer strong doses, and therefore use pure creasotal by teaspoonfuls. Most patients will take it readily in that form, but with some it has to be covered by means of jam or even given in wafers. It can also be given in the form of a solution with oil, in emulsion with the yolk of eggs or mucilage of acacia or mixed with a light claret or hot milk, but I prescribe it by preference in the pure state. With creasotal it is possible to proceed to a thorough course of creasote-therapy. The maximum doses of Burlureaux can be exceeded without risk and such doses can be taken by the mouth. In exceptional cases creasotal can be injected subcutaneously. For this purpose I use pure creasotal previously warmed. Doses of 75 grains can thus be injected morning and night. The injections can also be administered by the rectum either as pure creasotal or as an emulsion made with the yolk of an egg. When the patient takes creasotal internally by the mouth which is the method to be preferred, I give a teaspoonful morning and night for adults or in some cases even three times a day. For children under

ten years of age the maximum should be two teaspoonfuls per diem and under that age I give only half doses. The above doses have been found acceptable by practitioners generally. During the year 1897 I used creasotal and guaiacol carbonate as a pulmonary antiseptic in cases of ordinary bronchitis and intend to publish a treatise on this subject shortly. As a large proportion of the creasotal is eliminated in the urine (which is shown by the odour and the dark colour of the urine of many patients) I believe that it can with advantage be used, like salol, as an antiseptic of the urinary canal. I have used it in blennorrhœa, but further experiments are necessary in all cases of urinary infections. In two cases of incontinence of urine in children, the administration of creasotal has, within my knowledge, effected a cure but in other cases I have had no success. For dressing wounds and for treatment of tuberculous or osseous affections, or those of the nerve tissue, the use of creasotal can strongly be recommended as an injection around or into the diseased tissues in place of the chloride of zinc recommended by Lannelongue. It must be admitted that the odour of creasote given off by the patient under treatment with creasotal is a disadvantage, but this, after all, is only very slight. As contra-indicated, I only know of fever and diarrhœa. Some practitioners recommend the use of creasote and creasotal in cases of fever, but I do not agree with them."

Dr. R. Seifert of Radebeul, Germany, writes to the Editors of the London *Lancet* (Vol. I for 1898, page 960) criticising some points made by Dr. Chaumier as follows :

" Dr. Chaumier recommends that creasotal be taken by teaspoonfuls and considers the use of the drug contra-indicated only in fever and diarrhœa. According to the experiences, however, which we have been made acquainted with by the publications of the University Clinics of Berlin, Vienna, and Munich these contra-indications do not exist ; on the contrary, the action of creasotal and guaiacol carbonate is very favourable upon the fever of phthisical patients, this disappearing after a relatively short period of treatment with these drugs. The cause by which Dr. Chaumier was led to believe these drugs contra-indicated in fever probably lies in the fact that he employed larger doses than were necessary. It is neither necessary nor is it useful to take the creasotal by teaspoonfuls. The same remedial effects are obtained with the administration by drops, as introduced by Professor von Leyden of Berlin. These small doses, besides being less expensive, are also much better borne by all

patients, whereas the strong doses as used by Dr. Chaumier cannot be borne by many patients.

The *Charité Annalen* (Berlin, 1897) recently contained an interesting report on the results obtained with creasotal (creasote carbonate) in the University Clinic of Professor von Leyden. The conclusions arrived at by the experiments made under the direction of the chief surgeons of this clinic show that the remedial effect of the drug is not a merely symptomatic, but a specific one. After the administration of creasote, which drug was formerly also used by Professor von Leyden, it has always been noticed that the appetite disappeared, the general health grew worse, and symptoms of intense disturbance of the stomach and intestines soon followed. The creasotal was free from these noxious by-effects. The following mode of administration was adopted. Each patient began with five drops three times daily, increasing the dose three drops every day until twenty-five drops were taken at a dose. At this they were kept for from one to four weeks—in some cases even for several months; then the dose was diminished in a similar ratio until only ten drops were taken thrice daily, and then eventually the ascending scale was begun again.

The results obtained in von Leyden's clinic are fully detailed in the above-mentioned *Charité Annalen*. Though the greater part of the treatment was carried out during the winter months, when the climatic influences were unfavourable, very good results were nevertheless obtained. The general condition of the patients was markedly improved; fever, night sweats, and all the bad symptoms disappeared entirely after six weeks of treatment; the appetite rapidly increased. Even in cases where the patients had taken creasote before with the effect of causing a complete loss of appetite, under creasotal the appetite increased from week to week. Very much the same thing can be said of the weight, in which up to 16 lb. were gained in three months. Upon the night sweats and the fever the action of creasotal was very favourable. Cough and expectoration gradually diminished and finally disappeared altogether. Wherever the treatment was continued for over six months a marked improvement of the local condition was noticed. The lungs in these cases were partly cured. In some cases the physical symptoms of phthisis disappeared entirely after a treatment of from six to eight months, so that a perfect cure was obtained and the lungs of these patients were perfectly healed and quite normal again. Considering that in these cases only 300 grammes of creasotal were required

to obtain a perfect cure and that physicians can obtain from their druggists 1 oz. of creasotal at the average price of 2s., it will appear that the expenditure for the remedy, distributed over several months, is no drawback, and that also the poorest patients can afford to take part in the benefits of the drug.

In the report of Professor von Leyden's clinic the author concludes by saying : We think we are entitled to assume a specific action of creasotal. Reviewing our experiences we come to the opinion that any case of incipient or not too far advanced phthisis may be treated with creasotal with the expectation of a good result. Naturally a nourishing diet and general good hygiene must go hand in hand with it. And here is the chief advantage of creasotal over creasote, inasmuch as it improves the appetite and does not irritate the gastro-intestinal canal it permits us to enforce the proper dietetic treatment of the disease at the same time. Very much the same favourable views in regard to creasotal are expressed in the recently published reports of the university clinics of Vienna and Munich. I believe these experiences prove that Dr. Chaumier's objection to the administration of creasotal in fever is deprived of foundation. As above mentioned the presence of fever is, perhaps, to be considered as a contra-indication for the enormous doses of creasotal which Dr. Chaumier employs, while on the other hand the small doses as recommended by Professor von Leyden effect the disappearance of the fever."

Creosote (Beechwood) is still being experimented with in pulmonary tuberculosis. Many observers, however, have given it up as being of little use, for it is becoming more and more evident that hygienic influences and altitude, whereby pure air is obtained, are more potent elements than any medication. With very few exceptions observers will acknowledge that unless accompanying hygienic and other treatment is employed together with the Creosote few recoveries may be expected.

At a meeting of the Harveian Society of London on Thursday, October 21st last, the subject of Creosote in consumption was under discussion. Dr. Clifford Beale read a paper on his recent experience in the use of large doses in cases of consumption. He related a series of cases of incipient pulmonary tuberculosis, and also a series of chronic cases in both of which he noted that Creosote must be regarded rather as a useful adjunct to the many already existing methods of hygienic treatment. He employed Beechwood Creosote dissolved in Cod-liver Oil and found that of all the methods of

giving this agent this one appeared to be the least objectionable to the patient himself. Dr. St. Clair Thomson discussed the paper and although his experience was limited, from what he had heard Dr. Beale state, he would conclude that the improvement noted might be due to the rest and good food which the patients obtained in the well-ventilated wards of the hospital. Therefore before attributing any particular virtue to the Creosote, it would be necessary to record the results obtained in an equal number of similar cases treated without Creosote but under exactly the same conditions. Dr. Stamford G. Feele mentioned that he had found varying results from different brands of Creosote, and therefore he had abandoned it for Guaiacol Carbonate.

Mr. C. W. Graham of Carlisle, England, records a case of the tolerance of Creosote as follows: "It may be of interest to record briefly the particulars of a case under my care in which creosote was exhibited with apparently unique tolerance. A gentleman, aged 35, with a distinct phthisical family history, was attacked twelve months ago with pulmonary tuberculosis. Positive evidence from bacteriological examination of the sputum was from time to time forthcoming during a period of six weeks, when he was acutely ill. In addition to the general principles of treatment, so soon as the diagnosis was established, I prescribed beechwood creosote by the stomach, commencing with mij thrice daily, as well as inhalations of guaiacol. The patient who was possessed of scientific attainments, fully realized the nature of his illness, and was most anxious from the first to saturate his system with the drug, being imbued with a strong faith in it. The dose was very rapidly increased, till at the end of a month, when I sent him to Arôsa, he was taking exactly 340 minims in every twenty-four hours. He never had any toxic symptoms. During the two and a half months the patient was at Arôsa he continued to take between 3 and 4 fluid drachms each day. He returned completely restored to health in every detail. Shortly after his return home the patient's belief in creosote as a prophylactic inspired him to go on taking the drug, and this he has done ever since without any ill-effects, the dose varying from 100 to 140 minims a day. He continues in perfectly good health.

In searching records relating to the tolerance of creosote, I have failed to discover any parallel to this case. Advocates of creosote in the treatment of phthisis maintain that the value of it as a specific remedy must be in its exceptional tolerance. It should be noted that the patient inhaled large quantities of guaiacol all the

time he was taking creosote by the stomach." (*Brit. Med. Journ.*, Vol. I for 1898, page 144).

Commenting upon Mr. Graham's case Mr. Harry Campbell of Wimpole Street, London, W. England, writes as follows :

"Mr. C. W. Graham, in the *British Medical Journal* of January 15th, p. 144, refers to a case of his 'in which creosote was exhibited with apparently unique tolerance.' I would point out that by beginning with small doses and gradually increasing I have found little difficulty in getting patients to tolerate drachm doses three or four times a day. The best medium for such large doses, as Dr. Clifford Beale has pointed out, is cod-liver oil. If we wish to get the full therapeutic effect of this drug in phthisis we should not give less than one drachm thrice daily. When this quantity is given the patient becomes so impregnated with the drug that all his secretions acquire a strong odour of it. This is especially noticeable in the case of the expectoration, showing that the drug is eliminated in large quantities by the very organs we desire to influence by it." (*Brit. Med. Journ.*, Vol. I for 1898, page 299).

Dr. Charles Lamplough of London, England, has reported 100 cases of pulmonary tuberculosis treated with large doses of Beechwood Creosote in the City of London Hospital for Diseases of the Chest. He states that large doses are usually prescribed in an emulsion with Cod-liver Oil and sometimes in a mixture containing alcohol in which Creosote is freely soluble. He concludes as follows :

"Having compared the objections raised against the administration of beechwood creosote in phthisis with the results obtained at this hospital by treating 100 cases with this drug, I would suggest that the following points are worthy of consideration and further investigation.

1. The best beechwood creosote can be given with benefit, in amounts varying from 120 to 240 minims daily, in cases of pulmonary tuberculosis.

2. The drug is best administered in cod-liver oil or in a spirituous solution, and in some cases the 'creosote chamber' or oro-nasal inhaler may be ordered in addition, with advantage.

3. The dose should be small at first, but it can be rapidly increased to 40 minims three times daily for an adult. In 3 cases doses of 30 minims three times a day were well borne by children.

4. Large doses rarely cause any gastric disturbance ; on the contrary, the appetite is frequently increased, symptoms of dyspepsia

disappear, and cod-liver oil is more easily assimilated. The cough, expectoration, and night sweats are diminished, and the physical signs improved.

5. Owing to its disinfectant action in the alimentary canal the drug probably diminishes the risk of tuberculous enteritis by auto-infection when patients swallow their sputa, but owing to the increased peristalsis, which is created by creosote, it is usually contraindicated in cases where the ulceration is already advanced.

6. The drug does not tend to cause hæmoptysis, but rather to prevent its recurrence.

7. Creosote does not irritate the normal mucous membrane of the genito-urinary tract.

8. Owing to its extremely small cost pure creosote can be given to a much larger number of patients than the carbonates of creosote and guaiacol, which respectively cost four times and twelve times as much as the older drug." (*Brit. Med. Journ.*, Vol. I for 1898, page 1383).

Dr. E. Thomas of Geneva, Switzerland, has apparently had some experience in the use of Creosote enemata in 5 cases of tuberculous peritonitis. He makes use of an emulsion in Cod-liver Oil. The ages of the patients were from 7 to 46 years and they were in a moderately good condition, but either single or double pleuritis existed at the time or had previously existed. All the patients were suffering from anorexia, diarrhea or constipation and had some fever. He admits that some of these patients might possibly have recovered without such treatment, but the rapid gain in weight and general improvement were sufficient proofs to him of the value of Creosote in Cod-liver Oil. At times he would add a few drops of laudanum to insure the retention of the dose. The additional treatment was simply local in every case, consisting in painting with Iodoform Collodion of 10 per cent. strength. Nothing was given by the mouth.

Creosote Valerianate (Ecosote) is still being used and found to be of service. Dr. W. Zinn reports 80 additional cases treated with this form of Creosote since July of 1896 when it was first brought prominently forward. He claims that it is far less disturbing to the alimentary tract than simple Creosote is (*Therap. Monats.* Vol. 12, page 130).

Creosote Phosphate continues to be used by some observers with good effect. Dr. Boureau of Tours, France, has printed a Monograph on the combination of Creosote with Phosphoric Acid which

appears to act by adding to the acidity in such a way as to modify the tuberculous condition (*Nouveau Montpellier médical*, Vol. XLI, page 840).

Dr. Brissonnet of Tours, France, addressed the Congress for the Study of Tuberculosis, held in Paris from July 27th to August 1st last, on some new preparations of Creosote which he claims had less odor and taste and were better tolerated than the Beechwood Creosote. He alluded to Creosote Phosphate, Creosote Tanno-Phosphate and a combination of Formaldehyde with Creosote under the name of "Creosoform" which he described as being a greenish powder.

There has recently been offered a Phosphite of Creosote under the name of "Phosphotal" which appears as a thick liquid with an odor resembling Creosote. Clinical reports are still awaited.

The following formula has been recommended for the administration of Creosote in pill form.

Creosote.....	0.10	gramme (about 1½ grains)
Powd. Liquorice Root	0.20	" (" 3 ")
Water.....	0.05	" (" ⅔ ")

Dr. W. Hesse of Dresden, Prussia, has carried on a series of interesting experiments to determine the poisonous action of Creosote and Guaiacol in comparison with the carbonates of these agents. His experiments were six in number and made upon dogs, and his conclusions were that whereas Creosote and Guaiacol in large doses were found to be poisonous and produced death by their corrosive action, the carbonates of these agents in smaller doses produced little effect upon the system of the animals. (*Deut. Medicin. Wochensch. Therap. Beilage* Vol. 24, page 11).

Dermatol (Bismuth Subgallate) is so well established in the medical profession that there is little need for practitioners to mention it specially in the medical journals, therefore little has appeared under that head throughout the year.

Dextroform, the combination of Dextrin and Formaldehyde and closely allied in composition and therapeutic effects to Amyloform (Starch and Formaldehyde), has been little mentioned in the current medical literature of the year. Dr. Niessen, however, mentions it somewhat incidentally as a part of his "Experiments with some New Substitutes for Silver Nitrate in the Treatment of Gonorrhoea" (*Muench. Medicin. Wochensch.* Vol. XLV, page 359) and

states that after employing it in a limited number of cases, it proved of sufficient value to warrant its recommendation.

Diaphtherin (Oxy-Chin-Aseptol)—the antiseptic and astringent—was not all used up during the past year, for there was still enough on hand for Dr. F. Mays to experiment with. He now details his experience in its therapeutic applications although he admits that it is a substance that is no longer manufactured commercially.

“He reports a number of cases in which solutions of diaphtherin were effective in healing suppurative wounds and particularly suppurating inflammations of the mucous membranes. One patient, suffering from gonorrheal endometritis, was cured in about 4 days. A second, a man, suffering from cystitis of 6 years’ duration, was treated with daily irrigations of 0.5% solution, with immediate improvement and ultimately permanent cure. A third patient suffered from endometritis and mania. The former condition was cured after 5 injections of a 0.5% solution. A fourth patient suffered from otorrhea, and the fifth was Mays himself, who suffered from a similar condition; both were cured by washing with a 0.5% solution. In addition 2 cases are reported in which the patients suffered from crushes of the fingers and the terminal phalanx was saved by putting on a wet dressing of diaphtherin. Both wounds were exceedingly dirty when treatment was instituted. The only objection to the substance is that it has a tendency to make the hands and instruments black.” (*Muench. Medicin. Wochensch.* Vol. XLV, page 782).

Diuretin (Sodio-Theobromine Salicylate) is still prominently before the medical profession throughout the two Continents, but little new appears in the medical literature under this head. However, Dr. Dreschfeld read a paper on Diuretin at the fifth meeting for the session of 1897-98 of the Manchester (England) Therapeutical Society on May 25th last:

“After referring to the experimental results and clinical experiences of this drug recorded by some continental observers Dr. Dreschfeld stated that he had employed diuretin in many cases during the past eight years and he considered it a valuable remedial agent. He had found it act well in acute Bright’s disease, especially in cases in which the urine was scanty. He had frequently seen the urine increase in amount from 12 or 15 to 80 or 100 oz. in the twenty-four hours. In post-scarlatinal nephritis the drug did

not seem to give such good results. In chronic parenchymatous nephritis he had found it act when digitalis and other drugs had not succeeded, but the effects were only temporary. There was no definite reduction of the amount of albumin. On the other hand, there was no evidence of irritating action. In interstitial nephritis the results had been disappointing and in these cases toxic effects were more liable to occur. As regards its use in heart disease Dr. Dreschfeld had found diuretin of great value in cases of mitral disease, especially when the dropsical symptoms had come on suddenly. In aortic disease the results had not been so satisfactory : there was no relief to the anginal symptoms, no great diuresis, and the drug was not always well borne. In simple dilatation without valvular lesion where digitalis had failed diuretin had sometimes succeeded. In cirrhosis of the liver the effects of diuretin were sometimes startling. He had seen diuresis amounting to four or five quarts of urine in the twenty-four hours. The cases which seemed to respond best to diuretin were those in which dropsy had developed suddenly. In older people with ascites coming on gradually diuretin had failed. In two cases of pleuritic effusion Dr. Dreschfeld had observed rapid recovery under the use of diuretin, but in other cases no marked effect was observed. In cases of peritonitis no relief had been obtained ; he had not tried the drug in pericarditis and did not think it likely to be of much use. Dr. Dreschfeld considered diuretin to be a useful and powerful diuretic, acting probably on the epithelium of the convoluted tubules of the kidney. He gives it in from 10 to 12 gr. doses three times a day at first, increasing to 30 gr. doses if necessary. As regards its ill-effects, sometimes diuretin is not well borne, producing nausea, vomiting, and occasionally signs of collapse. Often when diuretin alone does not answer it succeeds on combining it with digitalis."

In the discussion which followed, the Secretary of the Society on behalf of Dr. Steell, showed a series of charts illustrating the Diuretic Effects of Diuretin in cases of aortic disease, mitral disease, functional heart disease, cirrhosis of the liver, and pleurisy. One of the charts showed a marked diuretic effect obtained three times in succession in the same patient. Dr. Steell gives Diuretin in 2 gr. doses every hour day and night. In two cases of Bright's disease he had observed hæmaturia following the use of Diuretin and had not employed the drug in such cases since.

Dr. J. Dixon Mann, the President of the Society, had observed similar results to those described by Dr. Dreschfeld, but he had ob-

tained no good effects in cases of large white kidney. In heart cases he had found diuretin very useful. In cirrhosis of the liver he had observed little result, perhaps because the cases were of more gradual onset. He had found theobromine alone very useful and suggested that theobromine in some soluble form might be more advantageous than diuretin, which was sometimes depressing owing to the salicylate of sodium which it contained. (London *Lancet* Vol. I for 1898, page 1621).

Eka-Iodoform, said to be a mixture of Paraform and Iodoform and offered as a new substitute for Iodoform last year, has not been heard of throughout the year past in the current medical literature.

Ergot of the proper quality is unfortunately becoming more difficult to obtain each year. There is undoubtedly much of this article to be found in the market each season but its therapeutic efficiency is quite deficient. Poor seasons for its proper development are becoming more frequent as the demand increases to supply the growing wants, and where one or more poor seasons succeed each other the lack of a good quality becomes more embarrassing. Therefore it is not surprising that increased efforts are being made towards its preservation from one season to another. In France the preservation has been attempted by Mons. L. Aymonier, by immersing the fresh Ergot in an ethereal tincture of tolu, permitting it to dry and then preserving it in well sealed packages. The Ergot thus thoroughly varnished with the coating of tolu has been preserved, according to records, for eight months without any visible change, and the statement is made that it would no doubt keep for an indefinite period. The English claim that this practice has been known by them for many years. They claim that the Ergot so treated has a slight taste, which is quite natural, but it otherwise leaves the Ergot unaffected. It is recommended, however, that the fluid preparation should be made of the fresh Ergot at once and thus insure its keeping. Mr. John Moss of Galen Works, London, S. E., England, writes a note (*Chem. and Drug*. Vol. LII, page 220) stating :

“ Before the British Pharmaceutical Conference at Aberdeen, in 1885, I read a note describing an experiment which was carried out originally at the suggestion of that veteran pharmacist, T. B. Groves. Ergot was crushed to a coarse powder, then put into a hydraulic press, and as much as possible of the oil squeezed out.

The cake that was left resembled a piece of linseed cake—as hard and dry as a board is. It was wrapped in paper in the ordinary way, and left on a shelf for seven years. No weevil got his tooth into it, and some liquid extract prepared therefrom was employed in several cases and found to be as effective as the same preparation from fresh sound ergot. The plan described was not so fortunate as to secure the approval and support of Professor Kobert, whose authority on ergot is so justly worthy of respect. Why, I don't know; but I hold, nevertheless, that an affirmative experiment of this nature is more valuable than any number of failures, as showing that ergot can be preserved under very ordinary conditions if pressed into a cake and the oil squeezed out."

On this side of the Atlantic a still better practice is carried out and that is to sprinkle chloroform liberally through a large package of either the whole Ergot or the ground Ergot and properly seal the package. By such a device it is preserved practically indefinitely for there is little chance for the peculiar insect to live in that atmosphere.

Ethyl Bromide (Hydrobromic Ether) is still being urged by many who have not had sufficiently disappointing results to make them inclined to give it up in favor of the safer anæsthetics. However little has been written definitely upon its use. The most prominent article in the current medical literature throughout the year is that of Dr. Frank C. Hammond on "Anæsthesia and Anæsthetics, with a plea for the more General Employment of Chloroform and Ethyl Bromide." (*Ther. Gaz.* Vol. XXII, page 511). He concludes by making an earnest plea for its more general employment, "owing to the very limited time required to produce its effects, the post-anæsthetic symptoms are practically *nil*, the patient reacts very readily, and is able to resume routine duties within a short time after consciousness is restored. Above all, self confidence is needed; keep a cool, clear head, and be prepared to meet any emergencies that may arise."

Ethyl Chloride (Muriatic Ether) continues to receive a moderate amount of attention and some observers have made reports of their experience. Its purity has been more nearly perfected, and therefore it has a better chance to be considered favorably.

Dr. Josef Pireher of Innsbruck, Austria, has written an article on "Ethyl-Chlorid Nareosis" (*Wien. klin. Wochens.* Vol. LXI, page 511). He states he had had 141 cases of general anæsthesia

with this agent including general surgical operations, osteoclasis for club-foot, in the reduction and dressing of fractures, in the reduction of various luxations and in the many operations which have required the use of the Paquelin cautery. He claims the chief advantages to be the very rapid production of anæsthesia with loss of consciousness at once, and on the other hand the rapid return of consciousness upon withdrawing the anæsthetic. The short period of excitation is also a point of advantage which he constantly observed. He argues that the psychic center is first affected and the reflex center later. Throughout his 141 cases he observed no dangerous symptoms from its administration. He would only recommend this anæsthetic in place of Chloroform when the patient's age and the condition of his lungs, kidneys and other organs would seem to contra-indicate the use of Chloroform. He found it quite impossible to prolong the narcosis indefinitely, and the longest time which he kept any of his 141 cases under its influence was 25 minutes.

Drs. Pietet and Bengué of Paris have each offered to the profession what is claimed to be a strictly chemically pure product. They each have their special little apparatus, the former consisting of a vessel which is made to stand upright, on the shoulder of which is a screw valve connected with a bent glass tube which dips to the bottom of the liquid when the vessel is in the upright position. When a spray is desired the valve is simply removed and a jet of liquid is forced out by the pressure of the vapor within. When the vessel is turned upside down the flow of the liquid soon ceases for the end of the tube within then projects above the level of the liquid. The curve in the glass tube within is useful also in preventing the capillary opening from getting choked up. Dr. Bengué's little tube is of a mole-like shape with a drawn out snout, and a file mark on the prolonged end to be cut off when the spray is to be used.

Eucaine (Benzoyl-Vinyl-Di-Aceton-Alkamin) has apparently gone through the experimental stage of all new and effective agents and now is settling back into its proper sphere of usefulness. Some observers have even gone so far as to look with disfavor upon it, but as far as can be observed such disfavor is no more serious than a similar disposition which was shown in regard to Cocaine when it was going through its parallel stage. It is probably in dental surgery that its largest use is seen. Dr. A. Legrand makes use of a 2 per cent. solution which has been sterilized by boiling. This apparently is a stable solution which he finds to be free from danger and

allows him to proceed with his extractions at once, and the patient is allowed to rise and leave his office immediately after the operation. With Cocaine, however, although a 1 per cent. solution is effective, the dentists evidently have to observe the precaution of keeping the patient in a horizontal position for an hour or so after the operation has been completed, in order to avoid vertigo, the tendency towards syncope and peculiar pains in the stomach. Other observers make use of a 1 per cent. solution of this agent but that strength appears to require a delay of at least 5 minutes before an extraction can be begun.

Dr. Paul Reclus reports having used "Eucaine- β " for over six months and expresses great satisfaction in that stable solutions may be obtained by boiling, whereas with Cocaine eegonine is formed after boiling which he finds is deficient in analgesic effects. He finds Eucaine to be less toxic than Cocaine and its anæsthetic effect weaker. He prefers a 2 per cent. solution for injecting into the tissues. It appears to cause local vaso-dilatation and thus hemorrhage is apt to occur. He finally concludes that Cocaine, when carefully employed, is to be preferred." (*Bulletin de l'Acad. de Méd.*, Vol. XXXIX, page 359).

In regard to the keeping qualities of a solution of Eucaine it is reported that the dentists find that the best strength for general use is about 1 to 19 and that a 9 per cent. solution is about the strongest that will remain permanent. If it is attempted to keep a stronger solution the Eucaine apparently separates out. Dr. Legrand finds that when using it on inflamed tissues the results are just about as uncertain as from Cocaine, and upon mucous surfaces and in wounds a disagreeable burning sensation is experienced which is usually felt about 25 minutes after complete anæsthesia is accomplished, and which may last as long as an hour and a half.

"Zaloga (Khirurgya February 1898) considers eucaine a more valuable local anæsthetic in dental surgery than cocaine. In the course of six months he made use of cocaine in 220 cases of tooth extraction while eucaine was used in 320 cases for the same purpose. In each case the hydrochlorate of the alkaloid was used, and about 1 c. cm. of solution was injected deeply into the gum in two places on each side of the tooth. A 2 per cent. solution of hydrochlorate of cocaine was sufficient to produce local anæsthesia; but a 5 per cent. solution of eucaine hydrochlorate was necessary to get the same result. The doses of the two alkaloids were therefore 0.02 and 0.05 g. respectively. Toxic effects were observed in 46 per cent. of cases

where cocaine was used. The symptoms of poisoning ranged from a slight giddiness to faintness, cold perspiration, dilated pupils, sickness, and irregular respiration. None of these symptoms followed the use of eucaine. The only drawback in the use of the latter alkaloid is the subsequent appearance of a painless swelling over the seat of injection. This peculiar effect was not due to any septicity of the solution, as the latter was carefully tested bacteriologically, and found free from germs." (*Epitome of Brit. Med. Journ.*, Vol. I for 1898, page 48).

From France we hear that Dr. Martin has employed a solution of the Hydrochlorate in a comparative way alongside of the Cocaine salt in affections of the larynx, nose and ears and apparently with favor to the former. He finds that it does not cause retraction of the nasal mucous membrane and although a slight smarting sensation is noticed when applied to the nose and larynx, it is much better borne than Cocaine. (*Bulletin Gén. de Thérap.*, Vol. 134, page 574).

Drs. W. Jobson Horne and Macleod Yearsley of Farringdon, London, England, have continued their previous investigations in the use of this agent as a local anæsthetic in surgery of the throat, nose and ear and now make a more complete report to follow their preliminary communication of last year. Their communication is quite complete and well worth consideration by those who are interested in this agent. They conclude as follows by a consideration of the after effects :

“ As regards the disturbances of sensation following the anæsthetic action of the drug, more particularly in the case of the pharynx, these are not only less unpleasant and less marked than those produced by cocaine, but more transient, and, speaking generally, after the lapse of an hour from the time of application, the subjective sensations may be described as normal. Those who have experienced the effects of both drugs have expressed a decided preference for eucaine.

Passing to a comparison of the toxic potentiality of the two drugs: we are able to supplement those cases in our preliminary paper, in which operations had to be abandoned on account of an idiosyncrasy for cocaine, but had been practical under eucaine, by quoting a case which came under our notice in a medical man :

A 10 per cent. solution of cocaine was applied to the right naris for a galvano-cantery operation. In two minutes the patient was much excited, gesticulating and talking loud and fast; three

minutes later this gave place to great depression ; the pulse became weak, slow, and slightly irregular, and there was a feeling of oppression in the cardiac region. He gradually recovered on lying down but complained of tingling and numbness in the calves of the legs, and a feeling of great weakness in the back which lasted the remainder of the day.

Four months later an 8 per cent. solution of eucaine was used for a similar purpose. The pulse remained the same in rate and character throughout. Anæsthesia was sufficient for the galvano-cautery. The only after-effect noted was 'a hot taste' at the right side of the pharynx lasting fifteen minutes.

Were eucaine to be of no further service than to act as an efficient substitute in cases such as we have mentioned in which an idiosyncrasy for cocaine precluded an operation, even then this new local anæsthetic could not be regarded otherwise than of importance.

So far in our experience with eucaine we have not met with a case in which a single symptom supervened in the least way suggestive of a toxic effect of the drug." (*Brit. Med. Journ.*, Vol. II for 1897, page 1560).

Dr. Lewis S. Somers of Philadelphia, Pa., reports (*Therap. Gaz.*, Vol. XXII, page 587) on his use of the Hydrochlorate "B" as a local anæsthetic in the nose, and closes as follows :

"From a study of the results obtained by the use of eucaine 'B,' the following conclusions as to its value compared with cocaine and the former eucaine may be deduced :

1. Eucaine hydrochlorate 'B' in three-per-cent. solution produces as complete anæsthesia of the nasal mucous membrane as does a four-per-cent. solution of cocaine.

2. Its action is slower than the latter drug.

3. The anæsthesia is dissipated more rapidly than that produced by cocaine.

4. It is non-toxic in the strength and manner here used.

5. As it has no apparent shrinking action on the turbinal investiture as has cocaine, it is therefore less valuable for nasal surgery than the last mentioned drug.

6. It is superior to the former variety of eucaine because its toxic properties are less, it is more rapid in action, is non-irritating, and the same degree of anæsthesia may be produced by smaller amounts of the drug."

In general surgery it is being used to an increasing extent to avoid general anæsthesia, for many reasons, especially in those patients

suffering from cardiac affections. Dr. Giuseppe Cipriani claims that the "Eucaine B" does not irritate the mucous membrane nor does it produce a hyperæmia which is at all inconvenient. He employs a strength of solution much greater than those mentioned above, as it varies from 2 to 6 per cent. With such increased strengths he gets very successful results in short operations.

Apparently the most critical test it has yet had was in its use in an amputation of the lower third of the leg of a 68 year old man upon whom neither chloroform nor ether was used. The stump healed rapidly and without pain. The plan adopted was to dissolve as much Eucaine as two or three tablespoonfuls of distilled water would take up, and then make use of this solution by injecting a few drops hypodermically under the skin. Injections about one inch apart were made completely around the limb, and after a delay of five minutes in order to permit the anæsthesia to be complete, the hypodermic needle was thrust more deeply into the muscular tissue and an injection made which resulted in producing complete anæsthesia in the immediate region of the amputation, and for three or four inches above and below. The operation was then undertaken promptly just as if chloroform had been administered. As the deeper tissues were reached a slight smarting sensation was noted which was relieved by a little more of the solution applied to the sensitive part.

Dr. Dwight S. Moore of Jamestown, N. D., has reported "A Case of Progressive Disease of the Bones of the Foot, Ankle and Leg" in which he amputated at the middle third of the limb under the local anæsthetic influence of Eucaine Hydrochlorate (*Journ. Amer. Med. Asso.*, Vol. XXX, page 1028). He concludes as follows :

"This operation shows conclusively that in those cases where previously existing pathologic conditions, or other causes render the administration of a general anæsthetic dangerous or inadvisable, the use of eucain will enable us to perform a painless operation, free from all the dangers and annoyances attending the use of chloroform or ether during their administration, the performance of the operation, or the emergence from the anæsthetic condition."

Eucasin, the new food compound, similar to Nutrose, and produced by passing ammonia gas over Casein obtained from milk, is still before the medical profession although this time last year little could be said upon it as having appeared in the literature.

Drs. A. Baginsky and Sommerfeld have taken pains to report their

study of this agent as a substitute for meat in the diet of two children with normal digestion. They took care that the diet of each was identical. The first was fed for four days on a mixed diet. Each portion of the food was carefully weighed and the elementary parts estimated. The four days following this, exactly the same allowance was made except that the meat of the previous diet was replaced by about two-sevenths of its weight of Eucasin. Then for a third series of four days the original mixed diet was renewed. Careful figures were taken of the body weight, the amount and analysis of the urine and feces, the quantity of nitrogen used, wasted and excreted and the amount of fat taken in and excreted. The results proved that the use of Eucasin led to no digestive disturbance. It, however, increased the excretion of nitrogen and very decidedly diminished the excretion of uric acid. It was therefore concluded that the child made good use of the Eucasin, at least as much as the meat and egg albumen, and thus the use of this agent could well replace such articles of food. These results no doubt will be interesting to those who have not known of such results when given to children.

Dr. Hugo Weiss of Vienna, Austria, has now published (*Wien. klin. Wochensh.* Vol. X, page 1140) his observations with the use of this agent in 79 cases. He found on first working with this agent that its disagreeable flavor of rotten cheese was so unpalatable that it retarded his progress in using it, but this objection has now been overcome by the manufacturers so that it is offered in such a form that it may be made up into palatable cakes, thick soups and chocolate. He finds its particular advantages three in number. First, it contains 95.65 per cent. of proteids, whereas beef only contains 20.63 per cent. Second, these proteids are in the most digestible form and give little fermentative change in the alimentary tract. He thus approves of the use of this agent in preference to the well-known meat extracts which he has noticed produce a marked indigestion after a time. Third, it is much cheaper than all similar preparations. His observations showed a noticeable increase in the weight of his healthy subjects experimented upon, without any digestive disturbances within three or four weeks. On the other hand with 40 of his patients who were affected with pulmonary and laryngeal tuberculosis a marked increase of flesh was observed when they were fed upon three or four tablespoonfuls of Eucasin, two to four eggs, a pint and a half of milk and some fat each day. His most marked results were obtained in two cases which gained 15

and 10 pounds respectively in 14 weeks. He considers this agent of marked value in all chronic cases of pulmonary tuberculosis where there is loss of appetite, and in acute affections of the apices of the lungs. In stomach troubles he finds it particularly efficient on account of its small bulk and ready absorbability. He has made good use of it in gastric ulcers, atony of the stomach and hyperemesis gravidarum; in chronic intestinal catarrh with constipation, particularly in fat anemic women with uric acid diathesis, it is of marked value and he has proved its efficiency in 8 cases of anemia and chlorosis. He finds that the excretion of uric acid is diminished in leukaemia when using this agent. He proposes to extend his somewhat limited use of it in diabetes, rheumatism, malignant disease and nephritis for more conclusive results.

Euchinin (Enquinine), the compound of Quinine introduced last year, has continued to be used, especially abroad. It has been employed in various forms of fever, neuralgia, pertussis and as a tonic in anemia and chlorosis, but little enthusiasm is manifested in its use when compared with the older standbys. In the hospitals of Milan, Italy, it appears to have been used on quite a large scale. 14 cases are reported. About the same action is attributed to it as to Quinine or Cinchona Bark. Most observers report that the peculiar physiological action of Quinine called cinchonism does not take place with this agent. One marked advantage of this agent is that it is quite tasteless when first placed on the tongue, but a very slight bitter taste becomes evident after remaining there some little time. This is quite a recommendation for it, especially when it is to be administered to children as it can be given either in the granular form with water, or in milk which appears to be a favorite way of administering it.

A paper on "Euchinin in Malaria" by St. Geo. Gray of St. Lucia, West Indies, appears in the *British Medical Journal* (Vol. I for 1898, page 551) which is interesting in this connection. He writes:

"Since last August I have been observing the effect of euchinin on malarial fevers, and, as far as my experience goes, I find it highly satisfactory in suitable cases.

Up to now I have only employed it in undoubted cases of malaria, where I find it superior to quinine in being tasteless and requiring a smaller dose to reduce the temperature. However, I must differ *in toto* from the statement reproduced in the *British Medical Journal* of December 11th, 1897, that euchinin does not cause

cinchonism, for I have seen it cause tinnitus aurium, deafness, and derangement of vision and sensation in a more marked degree than the same dose of quinine.

Contrary to the statement of Professor von Noorden, that 15 grains of quinine are equal to 25 or 30 grains of euchinin, I find that euchinin is a more powerful antipyretic than quinine, and that, in malarial fevers at least, 10 to 15 grains of euchinin are as efficacious as 20 to 25 or 30 grains of quinine sulphate, and that it nearly always, in doses of 12 to 15 grains, causes buzzing in the ears if not other symptoms of cinchonism.

The largest dose I have given has been 15 grains once or twice a day, always commencing with a good purge, which I consider essential in the treatment of all malarial fevers. This is sufficient in most cases, following the treatment with tonics and change of air if possible after the temperature has remained normal for a few days. I append notes of a few cases."

Here follows a clinical record of 5 cases, after which he concludes as follows :

"I have used euchinin in many other cases, but they are all similar to the above. To sum up :

1. Euchinin is as effective as quinine in malarial fever.
2. It causes cinchonism.
3. It is tasteless, therefore easily administered. This is its great advantage over quinine.

The readiest form of administering euchinin is the simple powder placed dry on the tongue and washed down by a little water. As it is very bulky, some patients prefer it in caehets ; but all solutions of euchinin that I have seen are decidedly bitter, presenting no advantage whatever over quinine.

I do not consider cinchonism such a fatal objection as the intensely bitter taste of quinine. My experience of malarial fevers is that quinine and the malarial poison being antidotes to one another, cinchonism is the sign that a sufficient quantity of quinine has been taken to overcome its antagonist the malarial poison, as mercurialism is the sign that the syphilitic poison is under control.

If euchinin can be proved to be even nearly as effectual as quinine, its tastelessness alone should recommend it to many as a substitute, notwithstanding that it is not altogether free from some of the other objections to quinine."

Eudoxin (Bismuth salt of Nosophen) is still claimed by not a few to be the best of the Bismuth salts as a gastro-intestinal

disinfectant. It has been particularly effective and pleasing in its action most generally in infantile diarrhea as reported from both this country and abroad. One report from this country will illustrate, that of Dr. M. Elezarian of N. Y. City, which will be found in the *N. Y. Med. Journ.* (Vol. LXVIII, page 270) in which he concludes as follows :

“ Altogether, I have used up to the present writing eudoxine in fifteen cases of diarrhœa, cases mostly in children, and the antiseptic effects of it in such cases have been marvelous. Preference should be given to eudoxine rather than bismuth subnitrate or carbonate, because we all know how poisonous bismuth is in large doses on the gastro-intestinal mucous membrane, and very frequently we are afraid to give full doses of bismuth to children for this reason only. Although we have other intestinal antiseptics, such as salol and salicylates, etc., there is reason for caution in administering any of these drugs on account of their toxic effects. I found eudoxine very harmless and giving no cause for any alarm. I have given as much as a grain every hour to a child a year old without any alarming results.

My impression is, from inquiring among my colleagues about eudoxine, that sometimes too small a dose is administered in certain cases, and therefore the result is disappointing to them, and they are apt to get easily discouraged, as we quite frequently do with any new drug before we are thoroughly convinced that we have given it a thorough, scientific, and unhesitating trial. The proper and effective dose will be understood and appreciated only after careful study of each individual idiosyncrasy and the disease.”

Euphthalmin is the Hydrochlorate of a Mandelic Acid derivative of α -Methyl-Vinyl-Di-Aceton-Alkamin which bears the same relation to Eucaine that Homatropin does to Tropæocaine. It is offered as a new mydriatic. It has been used with some effect as a substitute for both Atropin and Homatropin in ophthalmological practice. As closely as it resembles “Eucaine B” in its composition, it has no antiseptic properties. Dr. B. Treutler of Marburg, Prussia, has been one of the prominent observers who have reported. He draws the following conclusions :

“(1) The instillation of euphthalmine solutions into the eye causes only very slight and temporary inconvenience.

(2) Euphthalmine is a powerful mydriatic. A five- to ten-per-cent. solution produces the maximum expansion of the pupil in about the same time as a one-per-cent. homatropine solution.

(3) The mydriatic action is less intense and prompt with adults than with young people.

(4) As a mydriatic euphthalmine has the advantages over cocaine that it is more powerful in action and does not damage the corneal epithelium ; on the other hand, mydriasis is slower in development.

(5) Euphthalmine affects the accommodation less than homatropine does.

(6) The disappearance both of mydriasis and of the paresis of the accommodation takes place much more quickly than after the employment of homatropine.

(7) No unpleasant effects upon the organism have thus far been observed.” (*Klinisch. Monatsbl. für Augenheilk*, Vol. XXXV, page 285).

Dr. Winselmann of Berlin, Germany, reports that he finds this agent of much value for diagnostic purposes. When using a 5 per cent. solution initial mydriasis is produced in 20 minutes—the maximum effect in 32 minutes. When a 10 per cent. solution is used, 14 and 23 minutes elapse respectively. Slight pupillary reaction to light persists from 5 to 14 minutes later. There appears to be either no impairment of accommodation or only very slight, and reading does not appear to be interfered with. The maximum mydriasis extends from 3 to 3½ hours and the normal size of the pupil is resumed in about 7 hours. Neither conjunctival nor corneal irritation, pain nor tension is observed. (*Klinisch. Monatsbl. für Augenheilk*, Vol. XXXVI, page 253).

Europhen (Iso-Butyl-Ortho-Cresol Iodide)—the Iodoform substitute, containing 27.6 per cent. of Iodine—has received about as much attention during the past year as the year previous. Some surgeons seem to favor it very partially, and others again find little advantage in it over the other well-known agents. In fissures of the anus the following formula has been used with good effect :

Europhen..... 195 milligrammes (3 grains)
Cacao Butter..... 4 grammes (about 60 “)

made up into a suppository and introduced into the rectum every night and morning after the use of an enema. It is recommended also to sprinkle the anus with equal parts of this agent and Salol.

In wounds of various kinds, the following formula has been used:

Europhen..... 1 part
Castor Oil 1 “
Collodion 10 parts

In an article by Dr. J. Abbott Cantrell on "Scalds and Burns" (*Ther. Gaz.*, Vol. XXII, page 622), among other agents he mentions the use of Europhen in a very subordinate way.

At a meeting of the Philadelphia County Medical Society on December 8th last Dr. Lawrence F. Flick read a paper on the "Treatment of Tuberculosis with Inunctions of Europhen, and exhibited some patients. The patients had previously been under the ordinary treatment, including creosote, but it was not until the inunctions of europhen had been commenced that any improvement was noticed. This latter has been progressive and was most marked. At the same time the patients were taking creosote in doses approximating 40 drops three times a day, but as they had been taking this previously the good effects of the treatment were naturally ascribed to the europhen. Dr. M. B. Hartzell pointed out the inefficacy of europhen and other iodine preparations in diseases of the skin, and doubted inferentially the wisdom of administering such preparations in pulmonary tuberculosis. Drs. Henry Beates, L. J. Hammond and H. A. Hare also took part in the discussion, the latter remarking that if this treatment is to be employed the cases should be carefully selected. Dr. Flick maintained that the good effects of the treatment were to be accorded to the europhen, which he had latterly employed instead of iodoform because of its less offensive odor. He had long been convinced that iodine is the best remedy for the treatment of tuberculosis, and of the preparations of iodine europhen is the most desirable. It is especially to be employed in the incipency of the disorder, creosote being always indicated in the latter stages. The President, Dr. James Tyson, thought that the treatment commended itself for trial in view of the great importance of the subject." (*Phila. Med. Journ.*, Vol. I, page 11).

Dr. Edward O. Otis of Boston, Mass., has published an article on "Some Modern Methods of the Treatment of Phthisis, and its Symptoms" as read before the Massachusetts Medical Society on June 8th last (*Boston Med. and Surg. Journ.*, Vol. CXXXIX, pages 31 and 55) in which he mentions Dr. Flick's formula for an inunction as follows :

Europhen	4 grammes (60 grains)
Oil of Anise.....	4 " (60 ")
Olive Oil.....	75 " (2½ ounces)
Oil of Rose	1 drop

Exalgin (Methyl-Acetanilid)—the analgesic—still continues to be used but receives little mention in the medical literature in a special way. From Canada we hear through Dr. F. C. Caley of Newcastle of the remarkable relief obtained in severe dental neuralgia when 130 milligrammes (two grains) in an alcoholic solution of this agent is used. A single dose gives prompt relief in a few minutes, which appears to be lasting. He reports that 3.7 Cc. (60 minims) of alcohol will hold in solution 1.9 grammes (30 grains) of Exalgin even though a small quantity of water be added. On rare occasions an erythematous eruption occurs after the administration of this agent. Dr. G. Linossier of France reports noting a patient who previously could not take Antipyrin on account of such a rash, and having been given 260 milligrammes (4 grains) of Exalgin for the relief of headache exhibited a general erythema an hour after the dose was taken. The next day the body was found to be covered with round, bright red papular areas of quite a considerable size. The back of the hands and the digital interspaces showed ecchymotic elevations. The epidermis afterwards separated and a colorless liquid appeared in numerous bullæ. Extreme pain was felt when these papular areas were pressed upon, but no very marked itching was noticed. When these bullæ disappeared the site of each was the seat of extreme pain. The whole of the alimentary tract was affected, for a very decided burning pain apparently extended throughout its whole length. The gums were also affected with erythematous patches. In the course of three or four days all the above manifestations disappeared. (*Bulletin Général de Thérapeutique*, Vol. CXXXV, page 492).

Dr. E. A. Lermite of Stamford Hill, London, N. England, reports a case of "An Overdose of Exalgin" (*Brit. Med. Journ.*, Vol. I for 1898, page 1518) as follows:

"Last month I was attending Mrs. H. for severe facial neuralgia caused by several curious teeth. On April 28th I administered chloroform whilst the teeth were extracted. After the extraction the patient became very hysterical, and I gave a hypodermic injection of morphine and hyoscine. Later in the evening, on completely regaining consciousness, she complained that the pain in her face and head was as great as ever. Knowing by previous experience that the case was not amenable to treatment by bromides, quinine, or butyl-chloral-hydras, I ordered a mixture containing 2 grains of exalgine in 2 drachms, and ordered this dose to be taken every four hours. That night she took one dose, and the next morning at 8.20 A.M. a friend

administered two tablespoonsful of the mixture instead of two teaspoonsful. Thus she took 8 grains of exalgine as a single dose. Very shortly afterwards she exclaimed: 'I am dying, send for the doctor.' I arrived half an hour later, and found the patient sensible, although somewhat dazed. The pulse was 84, full, strong, and regular. The breathing was regular, and there was no dyspnœa. No symptoms of collapse were present.

I then received the following account from the patient:

'Shortly after taking the dose of medicine I noticed pain in the stomach and felt very faint, but not giddy. I also noticed that the pain in my head left me quite suddenly. I then lost my sight and felt paralysed, although still quite conscious and able to hear and understand all that was said in the room.' These symptoms disappeared gradually in about 20 minutes. With the exception of slight faintness about 9.45 A.M. the patient had no other unpleasant symptom. Later in the day the neuralgic pains recurred, though in a modified degree.

I consider the case one of interest, as I cannot find any report of so large a dose having been taken, whereas cases have been reported in which a dose of $1\frac{1}{4}$ grain has given rise to vertigo and faintness, and in one case it caused an epileptiform fit. The mildness of the symptoms and the rapid recovery are also remarkable."

For the sake of completeness and interest to those who care to read further on the subject, it may be interesting to state here that Dr. A. Lockhart Gillespie of Edinburgh, Scotland, wrote to the *British Medical Journal* (Vol. I for 1898, page 1692) in relation to the above case as follows:

"Dr. Lermite will find notes of a case in which the patient took 36 grains of exalgine between 2 and 11 P.M. in the *Edinburgh Medical Journal* for May, 1892, p. 1054, and a fuller account of the symptoms produced in the *Medical Press and Circular*, April, 1892."

Ferratin (Acid Albuminate of Iron) is apparently still in use by many observers on the other side of the Atlantic, but either there are comparatively few who are making use of it in this country or else the reports fail to appear in the current literature. Those reports which have been made are either old reports repeated or are made in such a way as not to be very convincing. As we might readily infer anemia and chlorosis are the two affections in which it has been most largely used. The formula recommended is:

Ferratin	15 grammes	(231½ grains)
Sodium Bicarb	9 “	(139 “)
Refined Sugar.....	15 “	(231½ “)

This is made up into 30 powders and one is given to an adult in a glass of sweetened water three times a day.

Ferripyrin (Ferropyrin), the hemostatic compound consisting of 64 per cent. Antipyrin, 24 per cent. Chlorine, and 12 per cent. Iron, has been practically unnoticed throughout the past year.

Filmogen (Pyroxylin dissolved in Acetone and a small portion of Castor Oil added) has not been heard of in the literature of the past year. When first alluded to here it gave promise of being a very satisfactory Collodion, and it is difficult to understand why it has not taken a place among the requisites of a surgeon.

Fluoral (Sodium Fluoride), recommended as a superior antiseptic has been practically unheard of anywhere in the current literature of the past year.

Formalin (40 per cent. Solution of Formaldehyde)—the now well-known antiseptic, disinfectant, deodorizer and germicide—has increased so much in importance and value that practically every medical practitioner knows about it from personal use. It is natural therefore to expect that the literature would become very voluminous, and in a comment here only a small part of the allusions can be even referred to. One of the most interesting and thorough studies of the disinfection of dwelling rooms with Formaldehyde vapor was undertaken by Dr. A. W. Fairbanks of Boston, Mass., in a series of experiments in the City Hospital at Charlottenburg, Germany, which will go to prove that this form of general disinfection will soon largely if not completely supersede the older methods (*Centralbl. für Bakteriöl., Parasitenk. und Infektionskr.*, Vol. XXIII, pages 20, 80, 138).

According to some observers the usual method adopted for disinfection with Formaldehyde vapor requires such a large proportion of steam for its effective working, that its activity is lessened. Therefore it has been suggested that 10 per cent. of glycerin be added to Formalin to overcome that difficulty, and that if this combination be sprayed from a suitable apparatus, much more satisfactory results will be obtained. Such a combination has now been offered under the name of “Glycoformal.”

Dr. Arthur Schlossmann of Dresden, Prussia, has made use of this combination with much success. A special apparatus has been

constructed consisting of a vessel in which water is boiled. The steam is allowed to enter a reservoir containing "Glycoformal." From this reservoir 4 pipes pass into the room to be disinfected. According to Dr. Schlossmann's experiments all forms of microbes are destroyed completely in three hours, and his claims for this method are as follows :

"(1) The sterilisation is absolute, (2) the closure of all cracks and clefts is not necessary, (3) the procedure requires only three hours, (4) there is no danger of explosions, (5) the method is cheap, (6) the glycoformal vapour is heavier than air and therefore sinks, and (7) the total disinfectant powers of the gas are obtained." (*Berlin. klin. Wochensch.*, Vol. XXXV, page 550). All windows and doors are opened wide for half an hour after such a disinfection and then closed and ammonia vapor or ammonia water introduced into the room in proportion to the amount of Formaldehyde which has been used. Finally the windows and doors are again opened for a while and the room is ready for occupancy.

Another important and thorough study of this agent as a disinfectant, especially in its practical application to the disinfection of infected dwellings, bedding, clothing, books, etc., has been undertaken and reported on by Drs. Wm. H. Park and Arthur R. Guerard of New York City under the supervision of the New York City Department of Health. Their report has now been published in full (*The Phila. Med. Journ.*, Vol. 2, pages 514 and 571). Their closing remarks and conclusions are as follows :

"Formaldehyd-gas is superior to sulphur dioxid as a disinfectant for dwellings (1) because it is more efficient and rapid in its action; (2) because it is less injurious in its effects on household goods; (3) because it is less toxic to the higher forms of animal life; (4) because, when supplied from a generator placed outside of the room and watched by an attendant, there is less danger of fire.

Apart from the cost of the apparatus and the greater time involved, formaldehyd-gas, generated from commercial formalin, is not more expensive than sulphur dioxid, viz., from 7 to 8 cents per 1,000 cubic feet being the cost of the disinfectant in either case.

Formaldehyd-gas is the best disinfectant at present known for the disinfection of infected dwellings. It is inferior in penetrative power to steam and dry heat at 230° F.; but for the disinfection of fine wearing apparel, furs, leather, upholstery, books and the like, which are injured by great heat, it is better adapted than any other disinfectant."

Dr. Alvah H. Doty, Health Officer of the Port of New York has reported the results of a thorough investigation of this agent as a disinfectant in his quarantine duties. The complete and quite extensive tests were made with the steel Formaldehyde tank or chamber on the disinfecting steamer James W. Wadsworth; also in a room of 1,000 cubic feet space made expressly for the purpose in the Laboratory of this Department. He apparently lends his unqualified approval to this form of disinfection for ships (*N. Y. Med. Journ.*, Vol. LXVI, page 517). In close connection with these investigations an interesting report is made upon this agent with special reference to its chemistry in disinfection, by Mr. Ernst J. Lederle, Ph.D., Consulting Chemist to the Health Officers' Department of the State of New York (*N. Y. Med. Journ.*, Vol. LXVI, page 526).

The U. S. Marine Hospital Service have undertaken researches at their Hygienic Laboratory and have concluded that rapid disinfection is obtained with high percentages of Formaldehyde. Dr. Ezra Kimball Sprague of the Marine Hospital Service makes the report (*Medical News*, Vol. LXXI, page 763) and gives the results of six experiments on pillows, mattresses, etc. He concludes as follows:

“While the specific time for exposure in vacuum with twenty per cent. of gas is one hour, and for the present it will not be lessened, the foregoing experiments demonstrate that the disinfection of clothing and articles of like nature can be accomplished in thirty minutes. It is not improbable that with higher percentages better results will be obtained, and in a future article it is intended to give the results of further experimentation; but enough data have already been given to prove that with formaldehyd rapid and efficient disinfection may be secured, and that, without injury to the most delicate fabrics.”

The possibilities and limitations of Formaldehyde as a disinfectant have been thoroughly investigated by Dr. Charles Harrington of the Harvard Medical School, Boston, Mass. He has carried on a series of 9 interesting and important experiments, and draws the following conclusions: “Formaldehyde has extraordinary power as a surface disinfectant, greater than that of any other known substance. It is not, however, absolutely thorough in all cases even as a surface disinfectant, as is shown by the results of the experiments in room-disinfection. Ordinary bacteria, and those of the highest resistance as well, when freely exposed to an atmosphere produced

by vaporizing approximately 110 c. c. of formalin in each 1000 cubic feet of space, are killed within two and one-half hours (Experiment 8). An atmosphere produced by approximately 290 c. c. in each 1,000 cubic feet will sterilize ordinary pathogenic bacteria, such as typhoid, staphylococcus aureus, etc., within a half-hour, and anthrax in from forty-five to sixty minutes, and will destroy typhoid protected by an envelope of cotton cloth in one hour, staphylococcus aureus similarly protected within two, and anthrax, also in cotton, within three hours (Experiment 6). An atmosphere of approximately 435 c. c. in each 1000 cubic feet, which would be in the proportion of about a quart to a room fifteen feet square and ten feet in height, will destroy all exposed organisms within a half hour, and others protected as above within an hour and a half (Experiment 5). The penetrating power of the gas depends largely upon the conditions as to moisture. Through dry pervious substances, as cotton cloth, absorbent cotton, hair, etc., it appears to penetrate more or less easily, but not always in sufficient amount to exert germicidal action, as is shown by the results with the tube cultures and flasks of decolorized fuchsin, which were stoppered in exactly the same manner. In the presence of moisture the penetrating power is practically *nil*. The experiments can lead to but one conclusion, therefore, that formaldehyde must be regarded and employed as a surface disinfectant, and can never be anything else, in spite of its power of penetration under favorable conditions. This conclusion is in accord with that of Aronson, Pfuhl, Niemann, Bose, Roux and Trillat, and Vaillard and L  moine.

It has been asserted by a number of authors, among them Aronson, Pfuhl, and Rosenberg, that formaldehyde exerts no deleterious action on higher organisms. The results produced by the gas on the two rabbits used in the first experiment were sufficiently certain to demonstrate the falsity of this theory and to render further experiment on my part in this direction unnecessary. The experience of several others, who are daily engaged in the work of house disinfection, has shown that animals, such as dogs and cats, which have accidentally been confined in rooms undergoing formaldehyde disinfection, rarely survive the operation when the latter is properly carried out. On the other hand, the experience of these same persons is that insects, such as roaches, flies, and bedbugs, are not much affected. My observations in this direction have been limited to the cases of occasional flies, and one dish of cockroaches, all of which were killed." (*Amer. Journ. of the Med. Sciences*, Vol. CXV, page 56).

In line with Dr. Harrington's conclusions Dr. G. W. Goler, Health Officer of Rochester, N. Y., has written a letter to the Editor of the *N. Y. Med. Record* (Vol. 53, page 501) entitled "Does Formaldehyde Disinfect?" and after enumerating five experiments concludes: "The results of these experiments lead me to believe that the value of formaldehyde as a disinfectant, with a sufficient penetrating power thoroughly to disinfect in practice, has not yet been proven."

Those who are still in doubt as to which of the many generators to use will be interested to read a report made by Dr. Joseph McFarland of Philadelphia, Pa., entitled "The Efficiency of the Formaldehyde Generators, with Remarks upon their use" (*Univ. Med. Mag.*, Vol. X, page 709) in which he figures three of the best generators.

Drs. F. G. Novy and H. H. Waite both of Ann Arbor, Mich., and connected with the State Board of Health have made careful experiments on "The Disinfection of Rooms" and made a report to the Michigan State Board of Health in May last (*Med. News*, Vol. LXXII, page 641) and concluded by stating that

"The following general directions for the disinfection of rooms may be of value :

1. All cracks or openings in the plaster or in the floor or about the door and windows should be caulked tight with cotton or with strips of cloth.

2. The linen, quilts, blankets, carpets, etc., should be stretched out on a line in order to expose as much surface to the disinfectant as possible. They should not be thrown into a heap. Books should be suspended by their covers so that the pages are all open and freely exposed.

3. The walls and floor of the room and the articles contained in it should be thoroughly sprayed with water. If masses of matter or sputum are dried down on the floor they should be soaked with water and loosened. No vessel of water should, however, be allowed to remain in the room.

4. One hundred and fifty centimeters (5 ounces) of the commercial forty-per-cent. solution of formalin for each 1000 cubic feet of space should be placed in the distilling-apparatus and as rapidly distilled as possible. The keyhole and spaces about the door should then be packed with cotton or cloth.

5. The room thus treated should remain closed at least ten hours. If there is much leakage of gas into the surrounding rooms a second or third injection of formaldehyd at intervals of two or three hours should be made."

Dr. Jacob R. Johns of Philadelphia, Pa., has made a report of one instance where immunization and Formaldehyde disinfection resulted in the stamping out of an epidemic. It was an epidemic of diphtheria in the "Shelter for Colored Orphans" in Philadelphia on November 15th last, and, with two exceptional cases which are accounted for, no instances of contagious or infectious disease have occurred since the date of disinfection. Dr. Johns concludes as follows :

"In the matter of disinfection it may be of interest to note briefly some of the many objects exposed in the apartments to the gas. The dormitories contained only articles of bedding and furniture, the floors being bare and very clean. The bed-clothes were disposed upon chairs, the mattresses turned partly upon edge, and all drawers partly opened.

In the play-rooms, the multitudinous belongings of the children, including books, scrap-pictures, etc., were scattered loosely about the floor and tables. The private closets were widely opened. In the school-rooms, each desk was opened and the books so disposed as to make them most accessible to the gas. The apartments having most articles exposed were subjected to a larger quantity of gas per 1000 cubic feet, and the room kept closed a longer time. No room was opened inside of four or five hours. In every particular the results were gratifying, and serve to illustrate, in a forcible manner, what may be accomplished in stamping out epidemics by the proper application of these recognized scientific measures." (*Phila. Med. Journ.*, Vol. I, page 606).

Drs. J. Petruschky and G. Hinz of Danzig, Prussia, have carried on a series of comparative experiments on "The Disinfection of Clothing with Formaldehyde-Gas" by exposing clothing and other household material to the effects of both the ordinary vapor as produced by the usual generators and that of a forced current of the vapor. They claim to have proven that the forced current will thoroughly disinfect inside of an hour. They found that occasionally there were some spores which resisted even this forced current, but they conclude that it is by far the best of all the methods of disinfection (*Deut. Medicin. Wochensch.*, Vol. 24, page 527).

Dr. Edward Martin has investigated the subject of "The Sterilization of Urethral Instruments with Paraform" (the polymeric form of Formaldehyde) and read a report of his results before the Philadelphia County Medical Society on January 12th last (*The Phila. Poly.*, Vol. VII, page 60).

Drs. H. O. Reik and W. T. Watson of the Johns Hopkins Hospital, Baltimore, Md., have made some experimental tests with apparatus for sterilizing instruments with Formaldehyde, and draw the following conclusions :

“ 1st. A lamp will burn in any absolutely closed chamber long enough to generate more than sufficient formaldehyde for its disinfection.

2nd. In a chamber of 1 cubic foot space 3 grains of paraform in 15 minutes, or 5 grains in 10 minutes, will accomplish disinfection.

3rd. The expense of such disinfection, including the cost of paraform and alcohol, will not exceed 1 cent, and the labor involved is almost nil.

4th. For the disinfection of small instruments, such as those used by ophthalmologists, otologists, laryngologists and dentists, it is by far the most convenient and speedy method.

5th. This method, probably better than any other, for the work designed, carries out the principles of disinfection laid down by Koch, viz. “ the absolutely certain destruction of all pathogenic organisms, in the shortest possible time, at the least expense and with a minimum of injury to the object of disinfection.” (*Bulletin of the Johns Hopkins Hospital*, Vol. VIII, page 261).

Dr. Reik made a supplementary report which should be read in direct connection with the above (*Bulletin of the Johns Hopkins Hospital*, Vol. IX, page 82).

Dr. P. I. Rajewski has investigated the subject of the sterilization of catgut and recommends that it be sterilized with a 1 per cent. solution of Formaldehyde while the gut is in the process of being manufactured, thus accomplishing the sterilization of the interior. The exterior may be kept sterilized by the various means now used. He advises the chemical action of Formaldehyde upon the animal product as being more reliable than the simple superficial physical contact of the vapor (*Centralbl. für Chirurgie*, Vol. 24, page 1147).

Dr. Charles Harrington of the Harvard Medical School, Boston, Mass., recommends “ A Simple Method for the Sterilization of Catgut.” He carried on a series of nine experiments and after putting the catgut to the critical test of breaking under a strain, he failed but once in 481 tests to break at the knot (*Amer. Journ. of the Med. Sciences*, Vol. CXV, page 544).

Dr. Charles Harper Richardson of Albany, N. Y., has proposed an apparatus for sterilizing dressings by Formaldehyde and has made a

report giving a cut of the apparatus, with bacteriological provings (*N. Y. Med. Record*, Vol. 53, page 861).

Drs. A. Landerer and C. Krämer both of Stuttgart, Germany, call attention to the fact that under ordinary conditions all the known disinfectants do not appear to destroy the germs of infection below the surface of the skin and therefore complete disinfection is not accomplished. He, however, has succeeded in producing absolute asepsis by using a 1 per cent. solution of Formaldehyde applied on an airtight compress after cleansing the parts well. Such a compress is left in contact from 12 to 36 hours, changing only once or twice. He claims that the solution penetrates the skin and destroys the germ (*Centralbl. für Chirurgie*, Vol. 25, page 209).

The compress form of application in the same strength as above is reported to be efficient in the treatment of slight burns. From observations actually made, all the pain ceases in about 20 minutes and even the redness about the burned part disappears after repeated applications of the compress with additional solution.

A series of experiments are being carried on by the Chicago Health Department whereby they will claim that disinfection may be carried on with Formaldehyde without apparatus. They evidently are making use simply of any number of sheets hung throughout rooms and apartments, and sprinkling the Formaldehyde solution upon them, whereby they claim that the dissipation of the vapors is sufficient to penetrate all parts.

This agent is now being tried in every known case where disinfection is called for, and the number of affections which are now reported where it is found of value, are so numerous that it would be quite impracticable to enumerate them here. A few, however, of the prominent ones will be mentioned.

Dr. George L. Richards of Fall River, Mass., has made use of it in atropic rhinitis. He mentions that it is quite irritating even in dilute solutions, and therefore he advises a preliminary spraying of the nose with Hydrochlorate of Cocaine solution. He claims that the crusts developed in this affection are diminished in number after its use, and the unpleasant odor is entirely destroyed (*Laryngoscope*, Vol. IV, page 283).

Dr. H. Moulton of Fort Smith, Ark., has made use of Formaldehyde in the treatment of blepharitis, and presented a short note on the subject at the meeting of the American Medical Association held at Denver, Colo., in June last. He concludes as follows :

“ I do not wish to say that I have not found benefit in many cases

from the use of other drugs, or that formalin is a permanent cure, but the proportion of cases benefited and the measure of relief afforded by this remedy is so vastly superior in my hands to other remedies, that I cannot do otherwise than call attention to it." (*Journ. Amer. Med. Asso.*, Vol. XXXI, page 641).

Dr. J. T. McShane of Indianapolis, Ind., has reported on a case of "Acne Rosacea Treated by Intradermal Injections of Formaldehyde" and concludes: "The results have been most gratifying, and now, after three months' observation and treatment, the face is normally white with little or no tendency to recurrence of the disease." (*Journ. Amer. Med. Asso.* Vol. XXIX, page 1261).

In axillary and palmar hyperidrosis, it has been recommended to use 10 to 20 grammes ($2\frac{1}{2}$ to 5 drachms) of Formalin with 30 grammes (about 1 ounce) of vaselin as an effective application to diminish the amount of sweating and destroy the characteristic odor. A 1 per cent. solution of Formaldehyde, however, has proved effective in hyperidrosis of the feet when applied once or twice, or even more times a day.

Dr. Tippel of Düsseldorf, Prussia, has experimented in this line, has verified the above conclusions, and as might be expected has found that this disinfectant solution is just as efficient in counteracting the disagreeable odors of the anal and genital regions. He makes use of a solution of the strength of 15 Cc. to the litre (a tablespoonful to the quart) of water. He has made use of it in cases of vaginal catarrh, in certain forms of cystitis and in decubitus. In the latter it appears to hasten the sloughing of the necrosed parts. The odor left on the hands in the dissecting and autopsy room is entirely removed by using this solution. He also confirms the observations of others as to its efficiency in deodorizing rooms and their contents (*Muench. Medicin. Wochensch.*, Vol. XLV, page 689).

At a recent meeting of the Odontological Society of Great Britain "Mr. J. F. Colyer read a short paper on Formaldehyde in the Treatment of the Dental Pulp, with especial reference to a formaldehyde cement under the name of 'Formagen.' He referred to the use of 'formalin' (40 per cent. solution of formaldehyde) and stated that Lepkowski had found it give excellent results with the pulp as far as regarded its germicide and preservative properties, but the pain caused by its use was a distinct disadvantage. 'Formagen,' which was composed of a fluid and powder said to be charged with formaldehyde vapour, gave on the other hand apparently good

results without pain. Various analyses of formagen which Mr. Colyer had obtained were referred to and it was pointed out that the main constituent of the powder was calcium carbonate and a caustic alkali, the fluid being methyl salicylate, eugenol, and phenol. The bacteriological researches of Max Banehwitz as to the use of formagen were referred to and also the results obtained by A. Kunert. Mr. Colyer stated that he had used the drug in almost every class of exposed and septic pulp and had found excellent results follow although the time he had used it did not permit of him forming a very definite opinion as to whether the results obtained would be quite permanent." (London *Lancet*, Vol. I for 1898, page 723).

A so-called "Geraniated Formol" is reported to be almost a specific in cases of toothache and in dental operations. 20 per cent. of geranium oil is added to Formalin in alcohol to produce this effective analgesic and antiseptic of a pleasant odor.

"W. C. Robinson, the chemist of the Philadelphia Board of Health, has recently called attention to the introduction of formaldehyd as a milk preservative, as a substitute for other more easily detected chemicals like boric acid or salicylic acid. This new adulterant is now being widely advertised in the local market, and it is presumed that it is extensively employed. The city milk inspectors have been ordered to be on the lookout for this latest adulterant, and have received instructions for detecting its presence in milk. They advocate that suspected samples of milk be treated with small quantities of a mixture of sulphuric acid and ferric chlorid, which produce even with a very weak solution of formaldehyd a distinct purplish-violet reaction. The test is an absolute one, Mr. Robinson claims, and should simplify the detection of this formerly considered undetected chemical." (*Med. News*, Vol. LXXII, page 601).

It is reported that a 1 per cent. solution of Formaldehyde diluted to one-tenth is an effective preservative for solutions of Cocaine.

Mr. Cecil H. Leaf, Demonstrator of Anatomy at the London Hospital, England, recommends Formalin as an injecting solution into the lymphatic vessels of the dead subject for demonstrating purposes, claiming that the usually used coloring matters are unsatisfactory because they stain the surrounding tissues as well as the vessels. This solution hardens and preserves the relations of the viscera of the subject. He has made a report of his observations in a paper entitled "A Method of Injecting the Lymphatic Vessels" and concludes as follows:

“(1) Quite possible to render the lymphatic vessels sufficiently plain for dissection purposes by the injection of a large quantity of formalin solution ; (2) the fresher the subject the greater the probability of success ; (3) as much pressure as possible (short of rupturing the heart or any large vessel) must be used ; and (4) in the inguinal region, at any rate, and possibly in other parts of the body, a communication exists between the veins and lymphatic vessels.” (London *Lancet*, Vol. I for 1898, page 1680).

Prof. H. Opperman of Berlin, Germany, has observed that any substance which dissolves in ammonia solution or combines with it is capable of combination with Formaldehyde, thus producing a much more effective disinfectant, deodorizer and preserver, and in some cases offering an efficient therapeutic agent.

Mr. Carl E. Smith, working for the Research Committee of the Revisors of the U. S. Pharmacopœia, proposes a modification of Legler's ammonia method for testing Formaldehyde, yielding good results. (*Amer. Journ. Pharmacy*, Vol. 70, page 86).

Gaiethol is a derivative of Guaiacol in which the methyl radical is replaced by an ethyl radical, and is substantially Guaiacol with an additional carbon atom added. It is chemically the Mono-Ethyl Ether of Pyro-Catechin. It is offered in the form of an oily liquid, insoluble in water and in glycerin, but readily soluble in alcohol, chloroform and ether. It crystallizes at a low temperature in colorless crystals. It is proposed as a mild substitute for Guaiacol in the treatment of pulmonary tuberculosis, but its analgesic property is claimed to be more marked. It has been given in five-drop doses in milk three times a day. It has also been applied locally for the relief of pain, or as a 10 per cent. emulsion in glycerin. Again in the form of an ointment, one part to six of vaselin. By some observers it is claimed that its internal administration shows no advantage over Guaiacol.

Dr. de Buek does not think very favorably of it although he reports some fair results as an external application in neuritis and neuralgia. He reports a case of very painful tuberculous cystitis which he relieved by the glycerine emulsion after injections of Silver Nitrate and Corrosive Sublimate had failed. Severe coxalgia has been much relieved by its use and he urges further clinical use of it.

Gelante, the skin dressing composed of Gelatin and Tragacanth, has received no attention in the medical literature of the year.

Glonoin (Nitroglycerin) continues to have its various uses, and some practitioners resort to it oftener than others.

Dr. Lawrence F. Fliek of Philadelphia, Pa., has made good use of it as a hemostatic in hemoptysis, and he reports his results in the form of a paper (*Phila. Med. Journ.*, Vol. I, page 344). He writes as follows :

“The routine treatment for hemoptysis as laid down in the text-books is the use of astringents and depressants. Opium, ergot, tannic and gallic acids are recommended, as also a free use of ice and salt. Variable results have been obtained by these agents, and occasionally a case has arisen which would not yield at all. It was such a case that caused me to reflect upon the rationality of the text-book treatment and to seek a new one.”

He then relates two of his cases and concludes as follows :

“Whilst my experience is too limited to warrant final conclusions about the action of the drug, in the cases in which I have used it, the result has been so uniform and prompt that I feel justified in calling the attention of the profession to it. That the action was due to the nitroglycerin, unless the results were mere coincidences, cannot be doubted, as I used absolutely no other treatment, not even ice, and gave the nitroglycerin in most instances in water.”

It has been used in small doses in the treatment of spasmodic croup when other agents have failed, and in persistent attacks of angina pectoris, in the form of the following formula :

Solution of Glonoin 1%.... 11 drops

Cherry Laurel Water 10 grammes (154 grains)

either in the form of 1 Ce. (16 minims) subcutaneous injections, or by the mouth in one or two drop doses.

Glutol (Formalin-Gelatin) has not been commented upon during the year under this head although its use is extending. The surgeon is now-a-days simply reporting his use of Formalin in a general way and not specifying the form in which he makes use of it; thus Formalin in the form of a Gelatin would not necessarily be specified under the name of Glutol.

Guaiaceticin (the new compound offered as a substitute for Cresote and Guaiaecol in the treatment of pulmonary tuberculosis) has had little mention made of it during the past year. One of the writers alluding to it is Dr. Wilhelm Gemünd of Munich, Bavaria, who has written an article on “Hyperlenkoeytosis Induced by Guaiaceticin in Experiments on Animals” (*Muench. Medicin. Wochensch.*, Vol. XLV, page 229). He experimented in the same line begun some time previous by Risel with dogs and rabbits and made quite

a study of the bactericidal action of the blood of animals before and after administering this agent.

Guaiacol (the chief constituent of Creosote) and its various combinations have as a rule been successfully used throughout the medical world during the past year. There are, however, still some observers who doubt the prominent position given to it by others. Prominent among this class is Dr. Edmond Chaumier of Tours, France, who has written an article on "Creosote and some of its Derivatives" (London *Lancet*, Vol. I for 1898, page 222) in which he comments upon the various derivatives as follows: "Guaiacol, which for some time received much praise no longer holds it own. It was thought to be the active principle of creosote, and it was believed that as such it could replace the latter, but its use, either by the mouth or as a hypodermic injection (in oily solution) has not been attended with satisfactory results. On the contrary, it has frequently caused local complaints, pain, indurations, boils, abscesses, &c. Guaiacol, while possessing all the disadvantages of creosote, is in no way superior to the latter, and at present it is more and more discarded, being now only applied as a remedy to rub into the skin as a fever alleviant and on a bandage on wounds to produce anæsthesia. It possesses no doubt antipyretic qualities, but the reduction of the temperature is of short duration and may be followed by excessive perspiration, collapse, or at least fainting, giddiness and nausea. Owing to these various drawbacks guaiacol does not rank among the more important antipyretics. As an analgesic although inferior to cocaine, it may be found useful as it can be left without risk to be handled by the patient and may also be found serviceable in skin diseases, particularly lupus and as a dressing for wounds."

Some varying reports have been made upon its application in infantile enteric fever, but a successful report comes from Dr. T. Rodini of Ripalta-on-Trigno, Italy, who has applied it at that stage of the fever in which the temperature becomes uniform. His case was that of a three year old boy showing symptoms of persistent drowsiness, decided cardiac weakness and hypostatic pulmonary congestion, with a temperature of 40.5°C . (105°F .) A cold-pack had previously been applied but produced cardiac collapse, and therefore was abandoned. The first result of the application of the Guaiacol was a reduction of one degree in temperature within a quarter of an hour. By half an hour the temperature was down almost to normal and copious sweating had set in. After four hours,

however, the temperature began slowly to rise. The applications were continued regularly, morning and evening, on the subsequent days with much benefit and no ill-effects. Defervescence took place during the third week and the treatment was kept up to that time.

Dr. James Donelan of the Italian Hospital, London, England, makes a report on his results of "The Guaiacol Treatment of Laryngeal Tuberculosis Especially by Submucous Injections" (London *Lancet*, Vol. II for 1897, page 1649) in which he claims that Guaiacol stands in the front rank in the treatment of tuberculosis affecting the respiratory system. The injections were made by the special syringe of Dr. W. F. Chappell of New York.

Dr. J. Edward Squire of the North London Hospital for Consumption (England) makes his report on "The Administration of Large Doses of Guaiacol in Phthisis" (London *Lancet*, Vol. I for 1898, page 993). He reports that it is quite an established fact that patients can take pure liquid Guaiacol in doses of 11 Cc. (180 minims) in a single day, not only without toxic effects but apparently with decided benefit.

Dr. Adolph Goldhammer of New York City reports on the use of this agent in Chronic Coughs, and yet he claims its value in this direction is not sufficiently established. Having had remarkable success in many cases of cough of long standing in which no tuberculous element could be recognized, he would go so far as to suggest its use in every case of cough of more than two weeks' duration. He relates five of his cases and concludes as follows :

"As regards the administration of guaiacol, it is very well borne in the majority of cases, if well diluted with milk, although it has a nasty taste. It very seldom deranges the digestion. Those who cannot bear its odor or taste can easily take it in capsules. I usually begin by giving five drops three times a day, in milk, to an adult. The dose may then be increased one drop daily up to fifteen drops three times a day. A child one year old can take two drops at a dose to start with, and then the dose may be increased slowly to four or five drops." (N. Y. *Med. Record*, Vol. 52, page 594).

The following formula has been suggested in the treatment of pertussis :

Guaiacol.....	1 part
Eucalyptol	1 "
Sterilized Olive Oil.....	10 parts

of which 2.5 Cc. (40 minims) are to be injected subcutaneously each day.

This agent has been used in quite a series of cases of serous pleurisy by applying it to the skin, whereby the exudations were made to entirely disappear. The applications were well borne and the local irritation was slight—so trifling indeed that several consecutive applications could have been made if required. In the series of cases seven applications were about the limit.

Dr. J. Lenz has made a study of some 52 cases in which he used this agent in the treatment of epididymitis, of which 50 were of gonorrheal origin. Either a 10 per cent. ointment with vaselin was employed, or one of 5 per cent. if the scrotum was tender. The latter was finally washed with soap and then with ether before the application was made. If the application was made in the acute stage he found that the fever, pain and swelling disappeared in from three to five days. Its action appeared to be less active in subacute cases, and very slight in chronic cases. The absorption of the Guaiacol appeared to be very rapid as it made its appearance in the urine in from 15 to 30 minutes, and none was found there in 24 hours, thus showing its rapid elimination as well.

In the same article by Dr. Chaumier alluded to above he summarizes on Guaiacol-Carbonate as follows :

“ It has given excellent results in medical practice, particularly abroad ; I use it sometimes but much prefer creasotal. Still guaiacol-carbonate should not be discarded as a therapeutic agent. In a prolonged illness like tuberculosis the patient frequently objects to taking continually the same remedy and there will then be no objection to replacing for a time the creasotal by guaiacol-carbonate. In affections other than tuberculosis, guaiacol-carbonate has been strongly recommended for typhoid fever ; and, according to Hölscher, even puerperal fever can be treated successfully with it. This medicament will also be found useful as a dressing and in many cases can replace iodoform for this purpose. I have tried other derivatives of creasote such as oleo-creasote, benzoate of creasote, and phosphate of guaiacol ; but all these remedies are very rarely employed although some could be made to render certain services.”

Dr. W. Hesse of Dresden, Germany, has made a report of his results in six experiments upon dogs with the idea of determining the toxic action of Creosote and Guaiacol in comparison with that of their Carbonates, and concludes that both Creosote and Guaiacol in large doses are poisonous, resulting in death through their corrosive action. On the other hand that their Carbonates even though

in large doses have practically no influence upon the system (*Deut. Medicin. Wochensch.*, Vol. 24 Therap. Beilage, page 11).

The use of Guaiacol Carbonate has grown considerably and is evidently the compound most largely preferred. Much has been written concerning it during the past year, and therefore only the most prominent allusions can be noted here. Dr. Gilbert A. Banatyne of Bath, England, has apparently changed his mode of treatment of rheumatoid arthritis on account of the success obtained with Guaiacol Carbonate. He has used such other agents as Creosotal and Benzosal but finds the former far more useful. His previous practice had been to use Creosote and Guaiacol simply, but they give evidence of considerable intestinal irritation, are too caustic and will coagulate albumin. Almost immediately, even in severe cases, relief from pain and swelling takes place and the local heat over the affected joints disappears. From his present observations the presence of nephritis appears to be the only contra-indication for its use (*Edinburgh Med. Journ.* Vol. III new series, page 60).

The Valerianate of Guaiacol appears to be favored by some. Dr. J. W. Wainwright of New York City relates his recent therapeutic application of the Valerianates of Creosote and Guaiacol in a paper read before the Section on Materia Medica, Therapeutics and Pharmacy at the last meeting of the American Medical Association, held in Denver, Colo., in June last. He makes a brief abstract of three clinical cases, and concludes as follows :

“ ‘I have reported these cases, they being typical of many cases I have been treating. Am using these preparations extensively in other cases, and have had uniformly good results.’ ”

The valerianates are being used at the Loomis Sanatorium for Consumptives, Liberty, N. Y. Dr. Stubbert, the physician in charge, in an article published in the *New York Medical Journal*, April 2, 1898, says that ‘geosot, valerianate of guaiacol, proved an agreeable form of administering guaiacol. It was found less irritating to the stomach than creosote.’ I have very little time to refer to other valuable uses of eosot and geosot, such as their value in overcoming irritability of the stomach as in cases reported by Dr. W. E. Anthony of Providence, R. I., where in the nausea of early pregnancy and the sick stomach of Bright’s disease of the kidneys they gave prompt relief. Having indicated some of the applications of the valerianates of creosote and guaiacol in clinical medicine and surgery, with one further reference I will close. Surgically Dr.

Rieck refers to two cases of lupus of the face cured by applications of geosot and also to two cases of tuberculosis or white swelling of the knee and hip joint cured by injections of geosot into the capsule of the joint. Dr. Rieck also positively states that the valerianate of guaiacol cures bone tuberculosis, though not through the usual channels of absorption but by direct local application and declares that there is no question but that the use of the valerianate of guaiacol will permit of a marked extension of conservative measures in the treatment of tuberculosis of the bones and joints" (*Journ. Amer. Med. Assoc.*, Vol. XXXI, page 821).

The Phosphite of Guaiacol has been recommended under the name of "Guaiacophosphal," which appears as a colorless, crystalline salt with a very distinct odor of Guaiacol. It is readily soluble in water and melts on heating. It is claimed to contain 95 per cent. of Guaiacol and 5 per cent. of Phosphorus. The simple statement is made that it presents distinct advantages over the other compounds heretofore used.

Guaiacol Sulphonic Acid has been brought forward and the potassium salt of this compound goes by the name of "Thiocol." It has been recommended by Dr. C. Schwarz as a new remedy in the treatment of tuberculosis. It is offered in the form of a fine, colorless powder with a somewhat bitter taste when first placed on the tongue, which will turn to a sweetish taste. It is claimed to contain about 60 per cent. of Guaiacol. It is quite odorless, readily soluble in water, non-irritating to mucous membranes, and is readily absorbed—these advantages are claimed to be sufficient to recognize its superiority. Dr. Schwarz advises as a dose from 10 to 14.5 grammes (154 to 220 grains) per day. He claims it increases the appetite and general body strength. The weight is increased and the cough much lessened. The purulent character of the expectoration ceases, and the night-sweats and fever disappear. He recommends its trial in chronic bronchitis, typhoid fever and intestinal catarrhs.

Another salt of Guaiacol Sulphonic Acid is the Calcium Guaiacol-Sulphonate which goes under the name of "Guaiacyl." It is recommended to be used in aqueous solutions of from 5 to 10 per cent., and proves to be a very effective anæsthetic in minor surgical operations and in dentistry. It is offered in the form of a grayish-blue powder, readily soluble in water and alcohol, but not in oil. It is claimed that the solutions are not irritant, are non-toxic and show no caustic action.

Dr. A. Breton of Dijon, France, reports his continued satisfactory results in the treatment of tuberculosis by the injection of the following mixture :

Iodoform.....	1	gramme (15 grains)
Guaiacol	4.5	grammes (75 ")
Sterilized Olive Oil.....	93	" (3 ounces)

He claims to have made over 500 injections, all of which showed distinctly favorable results in the way of relieving pulmonary symptoms and producing a general increase in body weight.

Guaiaquin (Quinine Guaiacol-Bi-Sulphonate)—the new substitute of last year for Guaiacol—has not appeared in the current medical literature of the past year although much was expected from it. Confirmatory clinical reports were surely looked for.

Guaiperol is the short name given to Piperidin Guaiacolate appearing in the form of colorless crystals with a slight creosote odor, soluble in water in the proportion of 1 to 30, but freely soluble in alcohol. It is recommended in the treatment of pulmonary tuberculosis, and has been known for some time past, but has not been used very generally. One of the most recent reports is from the Hospital for Consumption and Diseases of the Chest, at Brompton, England, from which Dr. Acland, the physician in charge, reports two cases of pulmonary tuberculosis treated by this agent. The report is as follows :

“In the *British Medical Journal* for January 16th, 1897, is a paper on ‘The Treatment of Phthisis by Guaiacolate of Piperidine,’ and as the drug has not been at present very extensively used, the two following cases are of interest as showing the same general conclusions as those arrived at by Dr. Arnold Chaplin and Dr. Tunnicliffe, namely, that the drug is safe, and well borne by the stomach, that it causes no unpleasant after-effects, and that the patients improved in general condition while under its influence.

Case 1.—W. M., aged 27, was admitted on December 1st, 1897, and discharged on March 19th, 1898. One sister had died of phthisis. He had cough, pain in chest, night-sweats, and dyspnoea for three years. The diagnosis was disseminated pulmonary tuberculosis, infiltration of both upper lobes, no softening or excavation. No tubercle bacilli were found in the sputum. He was treated with guaiperol, at first gr. 5, later gr. 10, in cachet three times a day after meals. While taking the drug he suffered no inconvenience ; in

fact, pain after food, which was one of his symptoms, disappeared and appetite increased. Night-sweats disappeared and temperature and cough improved. No change was detected in the physical signs. The weight increased by $9\frac{1}{4}$ lbs. While in the hospital he passed through an attack of influenza, which delayed his progress somewhat.

Case II.—J. M., aged 21, was admitted on January 5th, and discharged on March 31st, 1898. Four uncles and aunts on his mother's side had died of phthisis. For twelve months he had had cough, night-sweats, sleeplessness, and loss of appetite. The diagnosis was: Chronic pulmonary tuberculosis, not very active. Infiltration and early softening of right upper lobe. Infiltration left apex. Tubercle bacilli were present in fair numbers in the sputum. Guaiacol gr. 5 in eachet three times a day after meals was given all the time he was in the hospital. The temperature was a little irregular at first, but improved later, and did not go above 99° . The night-sweats disappeared, and the appetite improved. No discomfort was experienced from taking the drug. As regards physical signs, the note on January 5th says 'numerous small *râles* over right upper lobe increased by cough.' The note on March 30th says, 'a few *râles* heard after cough over right upper lobe.' Weight, at first decreasing, ultimately increased by $1\frac{1}{2}$ lb." (*Brit. Med. Journ.*, Vol. II for 1898, page 154).

Holocaine, the new synthetic local anæsthetic offered as a substitute for Cocaine, has received considerable attention during the past year. It naturally has been closely compared with Cocaine, and its points of difference have been given special notice. At a meeting of the Chicago Ophthalmological and Otological Society in October last, Dr. F. C. Hotz of Chicago, Ills., read a short note on "Holoceain vs. Cocain" giving the results of his observations. He concludes as follows:

"All these observations seem to show that the effect of holoceain is very quick, but superficial; it is therefore a very useful local anæsthetic for the removal of foreign bodies from the cornea, and for operations upon the conjunctiva; but for deeper operations, and especially for those which involve the opening of the globe (iridectomy and cataract extraction), I regard cocain as the more reliable anæsthetic." (*Journ. Amer. Med. Assn.*, Vol. XXIX, page 1012).

At the December meeting of the same Society the subject was again brought up with the following discussion which is of interest. Dr. Hotz opened again as follows:

“ At our meeting in October I read a brief report of my observations with holocain. Dr. Würdemann wrote me that his experience had been somewhat different, and suggested that we bring up the matter for discussion at this meeting. At the October meeting I stated that holocain was a very prompt, quick-acting anesthetic, but seemed to me not to penetrate deep enough to make it of value for more extensive and deeper operations, especially one involving the opening of the eyeball. Since that time I have used the remedy considerably and the results are about the same.

Dr. Würdemann followed Dr. Hotz in the discussion and said : ‘ Würdemann and Black have used holocain successfully in the following cases : Six cataract (simple) extractions, three cataract extractions with iridectomies, three cataract dissections, six iridectomies, eleven tenotomies, three tenotomies with advancement, six canaliculotomies, four chalazia, one sarcoma of conjunctival limbus, one pterygium, one curettement of corneal ulcer, two cauterizations of corneal ulcer, a number of foreign bodies in conjunctiva and cornea, as an instillation before the use of irritating medicines such as silver, bluestone, alum, iodine, etc., and direct application of electrode to corneal and conjunctival surfaces. The anesthetic qualities of holocain equal those of cocain, are no more irritant and excel cocain for operations on the bulb in the following : Its action is quicker and more lasting ; it more thoroughly anesthetizes the iris and deeper structures. It more thoroughly anesthetizes inflamed surfaces ; the anesthesia may be indefinitely prolonged ; the cornea does not desiccate under its use ; it does not affect the tension ; it does not act on the pupil or accommodation ; it does not interfere with the nutrition of the tissues but rather increases their blood supply and hastens healing ; its solutions are antiseptic ; it is already proportionately cheaper. The only disadvantage in the substitution of holocain for cocain for anesthetic purposes is that bleeding is more free under holocain. Although holocain possesses these distinct advantages over cocain when applied as a pure anesthetic, it has not and probably will not entirely supersede the older medicament.

Dr. Hotz—I can not quite understand on what ground Dr. Würdemann claims that the absorption of holocain is better than that of cocain. If I am correct, the absorption is a sort of osmotic process and has nothing to do with the circulation. We know that cocain combined with atropin is often more readily absorbed than atropin alone, so that cocain seems to increase the absorption. The pain

from the application of holocain is most intense in a 1 per cent. solution and the after-effects last for hours. One great advantage of the drug is that it will keep and does not undergo any chemie or bacteriologic change.''' (*Journ. Amer. Med. Asso.*, Vol. XXX, page 258).

Drs. Félix Lagrange and Francis Cosse of Bordeaux, France, report the results of their extended study of the comparative value of Holocaine and Cocaine in ophthalmic practice (*Recueil d' Ophtalmol.*, Vol. 19, page 625). They used a 1 per cent. Solution of the Hydrochlorate of Holocaine in 50 cases, and found that it was particularly efficacious whenever the conjunctiva was inflamed, giving a more rapid and complete anæsthesia and showing no destructive effect on the corneal epithelium. He found it also preferable in operations for strabismus, chalazion, pterygium and the extraction of foreign bodies from the conjunctiva and cornea. In iridectomy and cataract extraction the two anæsthetics in the following combination are found to be most effective :

Holocaine.....	0.05 grammes	(about $\frac{4}{5}$ grain)
Cocaine.....	0.10 "	(" $1\frac{1}{2}$ ")
Water.....	.....10.00 "	(" $2\frac{1}{2}$ drachms)

However, where it is desirable to lower the intraocular tension they found a 2 or 3 per cent. Cocaine Solution to be much preferred.

Dr. M. J. Chevalier reports a little different account of its action, for he finds practically no difference between the action of Holocaine and Cocaine as ordinarily used. He employed a 2 per cent. solution by instillation in 42 operations. For this practice he uses 4 or 5 drops at first which is followed immediately before the operation by 3 or 4 more. He finds that frequently it is necessary to repeat this quantity, for the effect does not last more than 10 or 12 minutes. He cautions those who have occasion to use it in large amount outside of ophthalmic practice, for the reason that death has occurred without premonitory signs (*Bulletin Général de Thérapeutique*, Vol. 134, page 609).

Dr. P. Gires of the Faculty of Paris, France, has written a Monograph as a contribution to the study of its physiological action, etc., which he has distributed among those interested. He sums up his conclusions in a concise way and gives a short list of references in the form of a Bibliography.

Dr. James Hinshelwood of Glasgow, Scotland, reported on the use of this agent in ophthalmic practice before the Section of

Ophthalmology of the British Medical Association at its meeting in Edinburgh, Scotland, last July. An Abstract of his remarks will be found in the *British Medical Journal* (Vol. II for 1898, page 619) and closes as follows :

“Holocaine is therefore a most valuable agent for the production of anæsthesia of the eye. Its peculiar value lies in the fact that apart from the anæsthesia, it seems to have no further effect on the eye whatever. It seems to act simply by paralysis of the sensory nerve endings, and has no other action on the eye, leaving the pupil accommodation and tension quite unaffected. The rapid action of the drug is also a decided advantage, and in dispensary practice where one is dealing with a large number of patients, leads to a considerable saving of time. According to Heinz a 1 per cent. solution of holocaine is powerfully antiseptic, as proved by experiments on the growth of bacteria, and therefore boiling the solution to sterilise it is not necessary. This is a further advantage that the solution is itself a powerful antiseptic.”

A short discussion followed.

Dr. Robert L. Randolph of Baltimore, Md., reports his “Conclusions from Clinical and Bacteriological Experiments with Holocain” and concludes as follows :

“Holocain, in so far as its anesthetic properties are concerned, seemed in these fifty-four cases to have been sufficiently effective. In those cases where a test was made of the rapidity of its action, as for instance in foreign bodies in the cornea, pterygia, and after the application of irritating substances, the quickness with which anesthesia was produced was striking. Whether the anesthesia produced after two minutes is sufficiently profound to guarantee a painless iridectomy or a satisfactory cataract extraction I did not determine, but in those cases where operations of this character were performed, and where the holocain was instilled just as we do cocain, no difference was observed in the anesthesia from that produced by the latter.

The drying of the cornea and desiccation of its epithelium and the dilatation of the pupil, the absence of which phenomena has been noted by others, have been confirmed by my own observations. The absence of these two properties should recommend it for office use for the removal of foreign bodies, as it is well known that after the employment of cocain in such cases, blurred vision and slight photophobia are often present for hours.

A 1 per cent. solution of holocain has not only an inhibitory

effect upon the pus organisms, but these organisms are killed when exposed to a solution of this strength for a certain length of time. No attempt was made to determine the point of time at which these organisms lose their vitality on exposure to holocain, but it may be safely said that this point is somewhere within twenty-four hours. Furthermore, exposure to a 1 per cent. solution of holocain for periods of five, ten, fifteen, twenty, twenty-five and thirty-five minutes showed in every instance a gradually diminishing number of colonies in the plates, so that it is plain, in spite of the luxuriant growth around the glass rods and pieces of wood, many of the organisms were killed.

It may be said in conclusion, then, that a solution of holocain of the strength employed in ophthalmic practice possesses distinct germicidal properties, a fact which it is evident enhances the value of this product." (*Johns Hopkins Hospital Bulletin*, Vol. IX, page 154.)

This article will also be found as having been presented to the Section on Ophthalmology of the American Medical Association at the meeting held in Denver, Colo., in June last in the *Journal of the Amer. Med. Association* (Vol. XXXI, page 706).

Dr. E. Coosemans of Belgium, Brussels, reports the results of his comparative investigations on the relative value of Cocaine and Holocaine when used in the treatment of diseases of the ear and larynx. In these cases he classes Holocaine as a perfect local anæsthetic. Its advantages are that it is about one-fifth the price; that its effective solution is 1 per cent. whereas Cocaine has to be used in strengths of 5 to 20 per cent.; it is non-irritating locally—unlike Cocaine; it is not extremely bitter like Cocaine; it produces no constriction in the larynx nor nauseating effects and causes no cerebral excitement; it shows its advantage when cauterization is to be employed by not contracting the vessels nor whitening the tissues; it has no general intoxicating effect and lastly the solution is not only antiseptic but is stable and can be readily sterilized (*Rev. hebdom. de Laryng., d'Otol. et de Rhin.*, Vol. 17 second half, page 1473).

Hydrargyrol is one of the newest antiseptics and comes from France. Chemically considered it is Mercury Para-Phenyl-Thionate. It is exhibited in brownish-red scale-like crystals, soluble in water and in glycerin, but insoluble in absolute alcohol. It claims to be an antiseptic superior to Corrosive Sublimate for it precipitates alkaloids and basic toxins, but not albumin. Bouillons are

completely sterilized with a solution of this agent in the proportion of 4 to 1000. The surgeon's instruments are not affected by even stronger solutions than this. By experiment it is found that solutions of 1 to 4000 are neither caustic nor irritating. Its toxic properties, as shown by experiments upon animals, are less than those of Corrosive Sublimate. Clinical reports have not yet been made outside of France.

Ichthalbin (Ichthyol-Albumen), the substitute for Ichthyol introduced to avoid the disagreeable properties of the latter, has not received much very definite attention. The most that is found in the medical literature is old (reports repeated). The only mention of prominence of recent date is that of Dr. Wolffberg of Breslau, Prussia, who has written an article (*Wochenschr. für Therapie und Hygiene des Auges*, Vol. I, page 257) where he states that he made use of 500 grammes (1 lb. 1½ ozs.) in 40 cases, chiefly of glaucoma and iritis where it showed marked analgesic effects. His dose internally was 0.5 gramme (7.7 grains) three times a day, and he draws the general conclusion that it may be used very effectively both internally and locally. He has made use of it also in fasciular keratitis, pannus and the like.

Ichthyol (Ammonium Ichthyol-Sulphonate) continues to be quite largely used. Drs. Combemale and Desoil "report that during fourteen months all the phthisical patients in the Charité Hospital at Lille were treated with ichthyol. Observations were made upon 110 patients who were treated with this drug to the exclusion of all other medication for periods varying from one to six months. Pills and capsules of ichthyol were found to be the least objectionable preparations. The daily dose at the beginning of treatment was 1 gram, but this was gradually increased to 4 grams unless diarrhea intervened, which was too strong to be controlled by moderate doses of dermatol. This happened in very few instances. If these doses of ichthyol were quickly tolerated there was a prompt improvement in the general health of the patient, as manifested by the disappearance of night-sweats, a gain in weight and strength, a reappearance of the menses, etc. This desirable improvement rarely manifested itself before the end of a month, and it did not occur at all in two-thirds of the patients. Expectoration was almost invariably lessened in amount and made more fluid, so that coughing was easier." (*Medical News*, Vol. LXXIII, page 144).

Dr. Le Tanneur of Paris, France, reports having experimented with this agent for at least two years back in such affections as

pulmonary tubercenlosis, dry catarrh, purulent catarrh, bronchial dilatation with fetid expectoration and acnte bronchitis. His uniformly successful results were obtained by giving it in doses of 260 milligrammes (about 4 grains). In some cases the cough disappeared completely within three days. He calls especial attention to the importance of giving this agent in the form of gluten capsules in order that they may be sure to reach the intestinal tract before their action begins. He has found that it is best to administer this agent immediately after eating and give from 4 to 8 of the above capsules within the 24 hours, divided up according to the meals (*Wien. Med. Blätter*, Vol. XX, page 783).

Dr. Cieglewicz reports favorable results with a 2 per cent. aqueous spray in acnte catarrhal laryngitis in both adults and children. The throat is not only sprayed with this solution but the patient is directed to inhale the same twice a day. The caution is given not to inhale too deeply as it is apt to produce nausea. He has found that spasmodic cough and hoarseness rapidly disappeared, and that suspected cases of false croup were rapidly relieved.

Dr. Domenico Pitruzzella of Italy has made good use of ointments in the treatment of gonorrhea. He reports having tried several drugs and Ichthyol was among them. He used Lanolin as a basis mixed with Olive Oil until a creamy consistency was obtained, when he applied it on a steel sound. His treatment lasted from 22 to 41 days and is recommended in chronic cases only (*Giorn. Ital. delle Malattie Veneree e della Pelle*, Vol. XXXII, page 442).

Dr. Oskar Bodenstein of Berlin, Germany, has reported on his treatment of 50 cases, with excellent results, in which chronic vaginal gonorrhea was treated with Ichthyol-Glycerin tampons (*Deut. Medicin. Wochensch.*, Vol. 23, page 669).

Dr. J. Leslie Callaghan of Coventry, England, also reports his success by the application of a 10 per cent. Ichthyol and Glycerin suppository. He has found such much more effective than the customary cotton-wool tampons, and much easier to apply, for it does not require the use of a speculum (*London Lancet*, Vol. II for 1897, page 1231).

Dr. Moncorvo, Jr., of Rio-de-Janeiro, Brazil, reported on his treatment of two cases of chyluria with Ichthyol, before a meeting of the Paris Therapeutical Society on November 24th last. He had previously tried Methylene Blue and Asaprol. He obtained his favorable results from doses varying from 0.5 gramme to 1.5 grammes (7.7 grains to 23.8 grains) given every 24 hours. Marked

improvement was evident in the first few days, but it required some months before the chyluria entirely disappeared (*Bulletin Gén. de Thérap.*, Vol. CXXXIV, page 717).

It has been reported that good results may be obtained in the treatment of measles by rubbing the body with a salve, morning and night, consisting of

Ichthyol	30 grammes (463 grains)
Lard	90 “ (about 3 ounces)

This practice was suggested by the favorable results obtained by the same treatment in variola. Only one or two rubbings seem to be necessary to reduce the temperature to normal, when the patches gradually grow pale and disappear. It requires only four or five days to complete the results, after which a warm bath removes what is left of the salve. A report on results in variola is made by Dr. I. S. Kolbassenko of Russia who employed this agent “in eighteen cases of variola, only two of which were fatal; these two cases were in a very serious condition when he undertook the treatment. From the time of appearance of the variola papules to the disappearance of the pustules, the following pomade is to be applied three times daily over the entire surface of the body: ichthyol, 10; oil of sweet almonds, 60; lanolin, 20. For economy in hospital practice vaseline may be substituted for oil of sweet almonds. During the stage of the prodromic fever until the appearance of the papule, i. e., from the time variola is suspected, the author applies all over the body a liniment containing equal parts of essence of eucalyptus, of ether, and of lanolin. This treatment has the advantage of suppressing, so to speak, the itching in the state of eruption; of diminishing fever in the state of suppuration (the temperature will not rise above 39.5° C.); of diminishing the suppuration itself, and of shortening by one-half the desquamative stage.” (*N. Y. Medical Record*, Vol. 52, page 739).

Remarkable success has been reported also in variola after the use of Collodion impregnated with 20 per cent. of Ichthyol.

Dr. Frank Parsons Norbury has made good use of equal parts of Camphor and Carbolic Acid, but found the following formula also useful:

Ichthyol	1 part
Ether	1 “
Flexible Collodion	2 parts

which was applied with a camel's hair brush.

It is reported that the following formula is effective in the treatment of psoriasis :

Ichthyol	3 parts
Salicylic Acid	3 “
Pyrogallic Acid	3 “
Olive Oil	10 “
Lanolin	10 “

A 10 per cent. gutta-percha plaster of Ichthyol has been recommended for the treatment of insect bites by applying with a camel's hair brush.

A 30 per cent. acacia mucilage of Ichthyol has been found to be of considerable service in the treatment of non-suppurating mastitis, by painting it on with a camel's hair brush. It appears to rapidly form an artificial covering which adheres well when dry, but can be readily removed by warm water, and by such application suppuration is at least very much diminished if not entirely prevented.

It has been reported that sulphur may be introduced into the system very effectively by means of Ichthyol. 20 to 30 drops of a 50 per cent. aqueous solution in a little peppermint water, beer or coffee are given in gelatin capsules or in the form of a pill. The eructations which generally occur at first appear not to last long, and the disagreeable taste and odor may be masked for those who greatly object to such, by coating the pills.

It has been suggested that if Ichthyol be distilled with steam it loses its disagreeable odor by reason of losing about one-half per cent. of its volatile oil. This product has not been tested sufficiently, either chemically or therapeutically, and therefore little is known of its practical results. The name of “Desichthol” has been assigned to this product.

Iodocrol is the name which has been adopted for Carvacrol Iodide, one of the innumerable substitutes for Iodoform. Carvacrol itself has been known in the past as possessing some antiseptic properties, and as being a constituent part of the oils of various species of *Origanum* and *Thymus*. Iodocrol is offered in the form of a yellowish-white, odorless powder, soluble in ether, chloroform and sulphur and is claimed to have increased antiseptic properties by virtue of the combination. It is reported that it has five times the bactericidal action that Iodoform has. It has been used in the treatment of gout in pill form in doses varying from 130 to 500 milligrammes (2 to 7.7 grains). Practically no clinical reports have yet appeared.

Iodoform has lost little if anything in recognition throughout the past year. The various substitutes which have been offered with more or less attractive claims have undoubtedly encouraged attention away from this agent, but during the past year for one reason or another the surgeons have fallen back on this old but very effective odoriferous agent. After considerable experimenting it is now claimed that it may be manufactured electrolytically by an improved method. This method is described as being the result of the reaction which takes place when a dilute solution of alcohol containing potassium iodide and sodium iodide is subjected to an electric current of one ampère at the temperature limit between 65° and 70° C. (149° and 158° F.) whereby 80 per cent. of the iodides are converted into Iodoform. The method has been slightly changed by forcing carbon dioxide gas through the solution which increased the yield considerably.

Little has been accomplished in effective means of getting rid of the disagreeable odor which is inherent in this agent, but Dr. A. Coustan of Montpellier, France, claims that the odor rapidly disappears from the hands, for instance, if they be washed with orange flower water.

Much has appeared in the literature throughout this year, and it would, as in the past, be quite impracticable to enumerate all that has been said about this agent. Therefore it must suffice to pick out some of the few comments to emphasize certain points. The following comment on its irritating property is of interest:

“In the *Indian Lancet* for December 1st, Mr. B. N. Chowdhry remarks that the properties of iodoform as described in the books are found different in practice, that the action of iodoform is not the same in all constitutions, and that it is not a non-irritant always. As an illustration of this, he relates his own experience. Two years before writing his article he struck his leg against a board, causing a wound which gradually turned into an ulcer. As the sore was healing rather slowly, he dusted some iodoform powder over it, thinking it would hasten the healing process, but a few hours afterward he found that the sore had become very irritable, and there was a continuous copious discharge of an acrid, watery fluid. Wherever the secretion touched the leg the skin became very irritable and rose in blisters which developed into fresh ulcers. These did not heal until after the use of the iodoform was discontinued, and other medicines were applied.

The author states that since then his skin has been very sensitive

to the action of iodoform, and that whenever his hands and fingers come in contact with the drug the skin becomes very irritable, and blisters form all over the hands, principally on the fingers. They continue for two or three days and then heal after the application of a caustic lotion.

The author states that he has seen many cases in which iodoform caused irritation when applied to sores, and produced inflammatory pustules on the surrounding skin. This irritant property, he says, is retained even when the iodoform is mixed with boric acid. In such cases the author substitutes finely powdered charcoal prepared by burning old leather. This acts in the same way as iodoform, but without showing any of its irritant properties." (*N. Y. Med. Journ.*, Vol. LXVII, page 103).

At a meeting of the Leeds (England) Medico-Chirurgical Society on October 15th last "Mr. Mayo Robson read a paper on the treatment of surgical tuberculosis, such as psoas abscess, tuberculous joints, tuberculous abscesses connected with ribs, tuberculous disease of the vesiculæ seminales, etc., which he had been treating for a number of years by iodoform injections with very satisfactory results. He described the details of the methods he employed, and he pointed out how in one class of cases—namely, tuberculous joints—operations at the Leeds Infirmary for excisions had fallen from 63 in 1891 to 33 in 1896, although a much larger number of cases had been treated. He attributed this change to the large number of cases that were now being successfully treated by iodoform injections. He dwelt on the great importance of strict asepsis in performing the operation, and remarked that, even if no good were done, no harm could follow; but, according to his experience, benefit had accrued in nearly every case, and in many cure had resulted." (*Brit. Med. Journ.*, Vol. II for 1897, page 1339).

As local tuberculosis takes such a prominent place among the cases which the surgeon meets, it was natural to at once have recourse to the use of Iodoform as a curative agent. As was almost foretold it was found to be most effective, and its use has been largely extended by using it as an injection in all tuberculous areas. The knife has been discarded, at least temporarily, and joints are not necessarily at once cut into. Abscesses as well are first injected with this agent. After some little experience, it has been agreed that about a 10 per cent. solution is the most universally adopted.

During the past year a young girl was presented to the Paris

Société de Chirurgie showing a perfect cure from a very large cold articular abscess of the knee by the use of Iodoform. It had been punctured, and immediately injected with Iodoform-ether. This particular case proved the good effects which might be obtained from such injections.

Dr. R. Hammerschlag of Schlan, Bohemia, reports his remarkable success with intraglandular injections of this agent in tuberculous lymph glands. He even met with success in those cases where the surgeon is almost universally called in—such cases as the large celled hyperplastic lymph glands of tuberculous subjects. He describes his plan and states that he begins, in the case of patients who can afford to carry out his line of treatment, change of climate, baths and the like before the injections. He then anaesthetizes the glandular region and injects from 1 to 2 Cc. (16.2 to 32.5 minims) of a 5 to 10 per cent. Iodoform-glycerin emulsion, continuing on one side for a week and then changing over to the other side for the next week. He has records of six cases showing remarkably rapid and satisfactory results. The tumors subsided so that they were brought down to the level of the skin, and no scars were left. In one of his cases, where he made the injections in the periphery of the gland, he had equally good results and suggests that comparative experiments be tried in order to ascertain whether it is best to inject intraglandularly or periglandularly (*Deut. Medicin. Wochensch.*, Vol. XXIII, page 826).

This agent has been tried in comparison with the regular tonic treatment, including the administration of Cod-liver Oil, in the treatment of pulmonary tuberculosis with varying doses up to a maximum of 2 grammes (about 30 grains) per day. The results are not very convincing as yet, although the comparatively large number of cases under observation showed rather better results with Iodoform.

Dr. E. L. Dawson of Camden, Arkansas, has published his results in the use of this agent in pulmonary tuberculosis by local application over the affected area of the lung. He reports as follows :

“In 1884 I began treating tuberculous patients with creosote, which was as much in evidence then as now, as a potent factor in the treatment of this scourge of mankind. I gave it in increasing doses so that 5, 10, and even 15 drops were taken three times a day. I was disappointed in every case in its efficacy. About 1893 I began to use strychnin, as recommended by Dr. Thomas Mays of

Philadelphia, with apparently better results. It was administered hypodermatically to the physiological limit. Later I made combination of strychnin, iron, and quinin. It then occurred to me to try to make, as nearly as possible, a local application to the diseased area of lung that thereby I might inhibit, if not destroy, the tubercle bacillus. Iodoform suggested itself as *the* drug for this important mission, iodoform being largely eliminated by the mucous membrane of the lung, so I added it to the above combination.

The results have been quite satisfactory in a rather large number of cases. No claim is made for it to cure advanced tubercular disease, nor to even mitigate *phthisis Florida*. But in incipient phthisis, when the patient begins to cough, accompanied by rapid pulse, pain in the chest, loss of appetite, and necessarily loss of flesh and strength, I have seen it act most advantageously.

I have never seen iodoform recommended in consumption, and in order that others may try it, and either prove or disprove the claim I make for its utility, is my chief object in writing this article. I began its use about eighteen months ago, and I have given more than 2500 pills made from this formula :

℞ Strychnin sulphate (0.065 grammes) gr. i
 Reduced iron
 Quinin sulphate } aa. (2.592 ") ʒij
 Iodoform

M. Ft. pil. No. XL. Sig. One pill after each meal.

Probably there is some incompatibility in this formula between quinin and iodoform, for the reason that not infrequently a patient will complain of pain in the stomach after taking a pill. I always speak of this to the patient and instruct him to discontinue taking the pills for a few days and then to begin again, being careful to keep the bowels well open. I have used the formula above mentioned with the quinin left out, and there was no complaint made of pain in the stomach, yet I doubt if with as good results as when the quinin was present. One drawback to the internal administration of iodoform is the disagreeable eructations which follow." (*Med. News*, Vol. LXVIII, page 474.)

This agent has been used during the past year, to some extent, in the broncho-pneumonia of measles in the following form :

Iodoform	0.5 gramme	(7.7 grains)
Cod-liver Oil	100.0 grammes	(3½ ounces)
Oil of Anise	2.0 " "	(30.9 grains)

The initial dose is 10 grammes (2 teaspoonfuls) per day, gradually increased up to the point of rejection by the stomach. Inhalations of a mixture of Iodoform and Turpentine are combined with the internal treatment. The great advantage claimed for this treatment, is that the pulmonary symptoms and fever pass away without delay, even though the treatment has not been begun early.

The external application of this agent in the form of a salve for acute articular rheumatism is recommended in the following formula :

Sodium Salicylate.....	30 grammes	(463.0 grains)
Iodoform.....	10 “	(154.3 “)
Vaselin.....	100 “	(3½ ounces)
Extract of Hyoseyamus.	5 “	(77.2 grains)

At a meeting of the Paris Biological Society, on October 16th last, a case of atrophy of the optic nerves produced by a burn, was related in which Iodoform was used in the treatment. The case was that of a woman who was burned on the thighs and arms by burning naphthalin. Iodoform was applied, and three weeks after she showed marked symptoms of amblyopia but no signs of general intoxication by this agent. Upon examination it was found that she showed a partial atrophy of the optic nerves, characteristic of atrophy by intoxication. The question, of course, was at once brought up whether the result was due to the burn or the application. It was pointed out that a burn generally produces lesions of an inflammatory nature which did not occur in this woman.

Dr. W. G. Porter read a paper at the Stated Meeting of the Philadelphia Academy of Surgery on December 6th last entitled “The Abuse of Iodoform,” which may be of interest to those who care to study the subject further. It will be found in the *Annals of Surgery* (Vol. XXVII, page 676).

Iodoformogen is another substitute for Iodoform. It has been introduced by a firm in Ludwigshafen, Bavaria, and is a combination of Iodoform and Albumen, forming an apparently stable compound of special service in many cases of superficial wounds and ulcers. It is presented in the form of a very fine, bright-yellow, odorless powder, insoluble in water. It possesses the valuable property of not caking and it does not adhere to any open surface to which it may be applied. Its claimed lack of odor is not quite correct, but it surely has not the extremely disagreeable and penetrating odor of Iodoform. It is one-third lighter in weight than Iodoform. It can be readily sterilized by bringing it to the

temperature of 100° C. (212° F.) It has been used in the treatment of all forms of foul and specific sores, and appears to be of special value when applied to indolent wounds.

Dr. Ernst Kromayer of Halle, Prussia, has apparently been the most extensive user of this article. He has made use of it in over 100 cases, and he relates the details of three of them. He finds that occasionally it acts as an irritant and has one of the recognized disadvantages of Iodoform in the way of producing eczema. However he claims that it is now the most efficient powder for dusting on wounds that has been presented to the surgeon. (*Berl. klin. Wochens.*, Vol. XXXV, page 217.)

Iodogallicin is a new antiseptic recently brought forward, with a chemical composition closely allied to Aïrol. It is claimed to be Bismuth Oxy-Iodo-Methyl-Gallol. As will be seen it results from the action of Bismuth Iodide upon Gallic Acid. There have been no clinical reports made concerning it as yet.

Iodol (Tetra-Iodo-Pyrrol)—the Iodoform substitute—has been little heard of during the past year. The one record of prominence is that of Dr. Labit who used a 10 per cent. solution in Collodion in the way of an abortive treatment for erysipelas. He thoroughly coated the affected region to an extent of over an inch beyond the immediately affected part. The Iodol was rapidly absorbed, for it was found to appear in the urine. Its beneficial action appeared to be usually very prompt, as all the symptoms would disappear within 24 hours. He explains the action of this method of application by stating that the Collodion seemed to produce sufficient pressure to render considerable aid, in that the penetration of the Iodol was promoted. Its application was in no way painful, but on the contrary rather soothing. From his observations it would show that this affection is rather local, at least at first, and therefore general treatment is not necessarily called for.

Itrol (Silver Citrate) has received somewhat more attention during the past year than in the year previous. It has been tested in a comparative way with the other silver salts and found to be of sufficient value to be retained as of practical use in certain cases. It is now offered in the form of 100 milligramme (1½ grain) tablets, in the form of gauze, and in 2 per cent. bougies made with cacao butter. Sutures of various kinds are saturated with it and kept wrapped in several folds of gauze which should be dipped in boiling water for a few minutes just before using, or they may be kept continuously in alcohol ready for immediate use.

The dentists find a silver-wool very effective, and this salt has been used in that way. Adhesive plaster has been impregnated with it to make a more effective temporary covering for cuts and the like.

Dr. Oscar Werler of Berlin, Germany, has pushed his investigations with this salt during the past year and publishes his results in the form of a paper on Improvements of Practical Importance in the Technique of Injections in the Treatment of Acute Gonorrhea with Solutions of Itrol. He has now employed this agent for at least a year and a half and he claims that it is increasing in popularity (*Berl. klin. Wochensch.*, Vol. XXXV, page 358).

Kreosolid (claimed to be a Magnesium compound of the phenols in Creosote—Kreosote)—the new Creosote preparation introduced last year—has not been heard of again during the past year. It did not even reach this side of the Atlantic, if a perusal of the current literature of the year can be relied on.

Kryofin, the new antipyretic of last year, closely allied to Phenacetin, has received more attention in this country as well as abroad during the past year. Dr. Bresler of Freiburg, Prussia, has published his report on its use in 16 cases of influenza. He carried on some comparative experiments by using Antipyrin and Phenacetin in some of the cases. It appears to act rather in the way of preventing a rise of temperature than to reduce an already high temperature, so that the plan Dr. Bresler adopted was to administer a dose of 500 milligrammes (7.7 grains) just before a rise in temperature is looked for (*Therap. Monatsh.*, Vol. XI, page 551).

Dr. M. A. Shlenker of Providence, R. I., reports his clinical observations of this agent in a little Monograph which he has distributed. His clinical cases amount to seven and he concludes as follows:

“From the experience with this drug thus far, it would seem to be a very valuable addition to materia medica. It is obviously prompt, effective in small doses, and safe; in fact, it possesses those qualities most to be desired in a drug of this kind.”

Drs. Sidney V. Haas and J. Bennett Morrison of New York City, have reported their results of a clinical study of this agent. They make the following statement:

“The conclusions we have drawn from its rather extensive use are as follows: As an antipyretic, while not reducing the temperature so rapidly nor so markedly as the other coal-tar products, it is certainly very efficacious, at the same time being a safer

remedy than the other members of the group, and its diaphoretic action being much less marked.

As an analgetic, it is at least equal to the other members of the group, with the advantage that it is sometimes effectual where the others have failed.

As a hypnotic, when insomnia is due to causes other than that of severe pain, it is of decided value, and probably superior to the other members of the group." (*N. Y. Med. Journ.*, Vol. LXVII, page 425).

In the report of their studies they refer to the case of an elderly woman suffering from pulmonary tuberculosis in the last stages, where after the administration of a moderately large dose, symptoms of collapse occurred. This was a case reported by Dr. E. Schreiber of Göttingen, Prussia, and will be found in the *Deut. Medicin. Wochensch.*, *Therap. Beilage* (Vol. XXIII, page 73).

Dr. John H. Curtis has made a report on this agent, in which he gives detailed notes of 10 cases and concludes as follows :

"From the foregoing cases and a review of many others I conclude that kryofine is : First, a prompt and safe antipyretic, unusually free from unpleasant collateral effects ; and second, an analgesic of great power and rapidity of action in all cases of neurotic character.

Kryofine is easy of administration, being tasteless, and is best given in powdered form, dry, upon the tongue. The tablets are not advisable unless first pulverized. Their effects are not so rapid or sure, probably because of the mixture of acacia necessary for their adhesion and compression." (*Ther. Gaz.*, Vol. XXII, page 303).

Dr. George Frank Butler of Chicago, Ills., has made a report on The Pharmacology and Therapeutics of this agent in a small Monograph distributed to the medical profession, in which he closes as follows :

"In conclusion, I would state that kryofine is purely a symptom medicine, being of no value in removing the cause, but acting only to relieve some symptom of disease—such as pain, pyrexia, etc. The chief benefit of the drug, therefore, is evidently apparent in acute conditions, which, if not complicated, are self-limiting, although pain and pyrexia, whether accompaniments of chronic or acute diseases, usually yield readily to the influence of this remedy.

Kryofine certainly possesses the advantages of safety, prompt and efficient action, tastelessness and facility of administration. The drug should claim high rank among analgesics and antipyretics,

and, while I have given in this paper only the results of individual experience, there are doubtless many disorders here unmentioned for which the physician may successfully employ kryoline, alike to the great relief of his patients and to his own satisfaction."

Lactophenin (π -Lactyl-Phenetidin)—closely related to Phenacetin—continues to be much lauded and no doubt universally used, still little has been reported specially in its favor. Dr. L. Hahn of Pyritz, Prussia, has continued to use it for a year and a half with good results. He finds it specially useful when administered to children for it reduces fever and restlessness without much effect on the pulse and strength. However he feels called upon to mention additional cases of severe icterus being produced after its use. He now has to put on formal record two cases in addition to his previous fourteen (*Deut. Medicin. Wochensch., Therap. Beilage*, Vol. XXIV, page 17).

Dr. Kurt Witthauer of Halle, Prussian Saxony, also reports on four cases of icterus resulting from the use of this agent. He has had very successful results in various cases of neuralgia and where an antipyretic is called for, but has to throw out the caution that care should be taken in its use. All his cases appeared to be the true catarrhal variety of icterus due to obstruction (*Therap. Monatsh.*, Vol. XII, page 111).

Dr. Armin Huber of Zurich, Switzerland, reports a case of a woman 53 years old who had suffered from hemorrhagic nephritis and beginning cirrhosis. She had been taking this agent with very little trouble until one day a prickly-heat was noted on her head. Her face became swollen and she had a chill that evening which was followed by a rise in temperature and a severe headache. On the following morning erythematous patches the size of a silver dollar were noted on the face. The upper lip was swollen considerably and vesicles the size of a bean appeared on the inner surface of the lip. Ulcerations of the same size which bled freely were also present. Her tongue was so much swollen that it was difficult to move it, and on one side it was considerably ulcerated. She felt a burning and itching sensation in the vagina and a small ulcer with cedematous swelling appeared on the vulva. Leucorrhœa was also present. In eight days the above symptoms disappeared and no ill-effects resulted, but the case emphasized the fact that such severe symptoms, although rare, may occur (*Correspondenzbl. für Schweiz. Aerzt.*, Vol. XXVII, page 742).

Largin is the name given by Dr. C. Pezzoli of Vienna, Austria,

to a new silver compound with albumin, containing 11.2 per cent. of silver which is larger than any other silver compound, and therefore it is claimed is that much more powerful. A solution of 1 to 4,000 destroys all forms of bacteria in 10 minutes and the gonococci in 5 minutes. It is recommended by Dr. Pezzoli as a new agent in the treatment of gonorrhea. He finds that it is so free from irritating effects, that from 1 to 1½ per cent. solutions may be retained in the urethra for as long as 30 minutes, and thus effect beneficial results. Such injections may be made several times a day. He reports on 41 cases of acute anterior urethritis of recent origin in which he used the treatment for an average of 30 days, 27 of which furnished successful results, in 8 cases little benefit was noticed. The remaining 6 were those in which the deep urethra was affected before this agent was employed and only two of these cases were benefited. He found that although its bactericidal power was greater than the other silver compounds, Protargol and Argentamin excel it in penetrating power. (*Wien. klin. Wochensch.*, Vol. XI, page 286).

Dr. Ferdinand Kornfeld of Vienna, Austria, has also employed this agent in 29 cases of gonorrhea in which he had very marked success. In a part of his cases, however, where the affection had extended to the posterior portion of the urethra and the urinary bladder, the solution of Largin produced only a decrease and not complete destruction of the gonococci. (*Wien. Medizin. Presse*, Vol. XXXIX, page 1306).

Loretin (Meta-Iod-Ortho-Oxy-Chinolin-Ana-Sulphonic Acid)—the Iodoform substitute—has not been specially alluded to during the past year.

Lycetol (Di-Methyl-Piperazin Tartrate)—the uric acid solvent—has not been alluded to as often during the past year as the year previous. The most prominent observation is that of “A Report on the Use of Salophen and Lycetol” by Dr. Paul Norwood of Omaha, Neb., in which, in comparison with most of the well-known agents used in the treatment of rheumatoid arthritis, he employed this comparatively new remedy. He found that owing to its agreeable taste and non-irritating properties, it could be administered over a somewhat prolonged period, and therefore he reports much encouragement from his limited use of it. (*Med. Times and Register*, Vol. XXXIV, page 271).

Lysol (the saponified product of coal-tar, chiefly composed of cresols)—the substitute offered for Carbolic Acid—has received more definite attention, by allusions made to itself individually, than

during the year previous. It must not be inferred, however, that there has necessarily been any lapse in the use of this article since its first introduction, for it has had its useful place from the beginning, although undoubtedly it was looked to to accomplish at first what was not promised of it. Its preference as a general disinfectant has been very definitely pointed out in many quarters, chief among which during the past year has been the Illinois State Board of Health. They have taken pains to emphasize the fact that it is much less dangerous as a poison than solutions of either Corrosive Sublimate or Carbolic Acid, and that it may be used in preference to either of these.

In a discussion which occurred at the meeting of the Berlin Medical Society on June 8th last after a paper written by Drs. R. Schaeffer and Paul Cohn on "Asepsis," Dr. Dührssen stated that he had employed for the past six years the following aseptic method of cleansing his hands. He brushes them for five minutes in hot water containing 1 per cent. of Lysol. The water is just short of boiling and is therefore somewhat painful when the hands are first introduced, but this appears to be quite a necessary part of the cleansing. (*Berlin. klin. Wochensch.*, Vol. XXXV, page 603).

Dr. A. L. Levy makes a report of having used this agent in cases of pityriasis versicolor, including himself, with such favorable results that he would invite others to try it in the same line. He applied the pure Lysol once every day for three days and then the day following washed the whole chest with a solution varying from $\frac{1}{2}$ to 1 per cent.—applying even to parts not affected. The affection entirely disappeared in eight days without giving any pain or irritation.

Although as above stated this agent is comparatively less toxic than some of the other disinfectants, still it has its poison cases recorded against it. One of the most prominent during the past year is that reported by Dr. G. Kluge of Kiel, Prussia. He records it in an article entitled "A Contribution to Lysol-Poisoning" (*Muench. Medicin. Wochensch.*, Vol. XLV, page 889). He adds this case of his to the 13 previously recorded. It was the case of a woman 35 years old, and occurred during a relapse in typhoid fever during which the nurse administered it by mistake. The danger apparently lay in the general symptoms which consisted of rapid coma and cardiac weakness. The temperature fell rapidly from 39° C. to 36° C. (102.2° F. to 96.8° F.) and the symptoms closely resembled those of poisoning by Carbolic Acid. The details of the case will be of interest to those who desire to follow up this subject.

Mallein, the tetanus antitoxin analogous to Tuberculin, has not been treated upon specially during the past year in the medical literature, but the veterinarians are naturally still much interested in it and from their standpoint they claim that it is becoming more widely appreciated. In March last Mr. W. E. Taylor, a veterinarian in London, read a paper on "Mallein and its Uses" before the Central Veterinary Medical Society. It is claimed by some members of that profession that it is being more largely used for diagnosing glanders.

Menthol has been written upon very considerably throughout the past year. It appears to be an effective ingredient in so many combinations, that only the most prominent comments, which may be of some little service, can be alluded to here. Dr. Rudolf Riegner of Berlin, Germany, has published the results of his "Comparative Investigations with Regard to the Effectiveness of Certain Gastric and Intestinal Antiseptics." It may be of interest to enumerate here the agents he compared: Menthol, Thymol, Chinosol, Chloral Hydrate, Resorcin, Actol, Crédé's Soluble Silver, Silver Nitrate, Steriform, Ichthyol and Sodium Salicylate (*Deut. Medicin. Wochensch.*, Vol. XXIV, page 390).

At a meeting of the Vienna Medical Club on October 20th last Dr. F. Müller reported the results of his treatment of chronic hay-fever by the use of the following formula:

Menthol.....	3 grammes (46.3 grains)
Resorcin.....	3 " (46.3 ")
Alcohol.....	14 " (216.1 ")

His cases were several patients coming from the United States and England. They were more or less neuropathic and were subject to gastro-intestinal troubles. As he always believed that there was a close relationship between gastro-intestinal disturbances and hay-fever he at once treated his cases by administering alkaline mineral waters, giving massage and other well-known forms of treatment in that line. In addition he applied a solution of Silver Nitrate to the nasal cavities by means of a brush, and irrigated with 7 or 8 litres of water, after which he applied the above solution.

Dr. R. Kafemann of Königsberg, Prussia, has recommended the following formula as being very efficient in the treatment of laryngitis and bronchial catarrh:

Menthol.....	4.0 grammes (61.7 grains)
Eucalyptol.....	2.5 " (38.0 ")
Terpinol..	2.0 " (30.9 ")
Pitch Pine Oil.....	1.0 " (15.4 ")

A few drops of this mixture is poured into a suitable glass vessel gently warmed over a flame, developing vapors which the patient inhales by any suitable means, but a glass tube ending in a pear-shaped bulb is recommended.

During the past year a mixture of finely powdered Menthol and common salt in the proportion of 1 to 10 is recommended to be dusted on varicose ulcers of the leg with good effect.

Dr. G. Schwersenski of Berlin, Germany, has brought forward a Menthol Valerianate for which the name has been coined of "Validol." It is claimed to be a chemical combination of Menthol and Valerianic Acid which appears to form a combination which has far less irritating properties than the Menthol alone. By assay it appears that the free Menthol amounts to 30 per cent. It is a clear, thick, colorless liquid having a mild odor, naturally like Menthol. It produces a cooling effect when applied to the skin. It has been recommended as a local application, and as a carminative and stomachic in 10 to 15 drop doses on a lump of sugar. It has been used locally in tonsillitis and pharyngitis.

Menthoxol is the name given to a combination of a 1 per cent. alcoholic solution of Menthol with a 3 per cent. Solution of Hydrogen Dioxide, and claimed to be a powerful germicide. A 10 per cent. solution of this new compound has been used in the treatment of abscesses and suppurating wounds. The action when applied to such wounded surfaces, is the same as when a Solution of Hydrogen Dioxide is applied, that of the evolution of gas forming quite a copious froth. The Menthol apparently has its good effect in deodorizing. Dr. Wagner of the Charité Hospital of Berlin, Germany, reports that these solutions undiluted will kill anthrax spores inside of three hours, which does not occur with the component parts by themselves. Dr. Wagner has records of 200 surgical cases in which this compound, as well as Camphoroxol and Naphthoxol were employed. (*Deut. Medicin. Wochensch., Therap. Beilage*, Vol. XXIII, page 74.)

Methæthyl (Methyl-Ethyl)—the new local anæsthetic of last year which was claimed to have some decided advantages over Ethyl Chloride—has not been heard of during the current year in the medical literature.

Methyl Salicylate (Synthetical Oil of Wintergreen) still continues to be favored and repeated arguments are made for the use of the synthetical oil in place of the natural product. Mr. Vida lends his testimony to its effect, especially when used in the treatment of

rheumatism. He fails to explain how the natural oil is so irritating whereas the synthetical is comparatively free from this objection. However it appears to be quite a settled fact (London *Lancet*, Vol. I for 1898, page 52).

Molteni reports his conclusions after its use. In sciatica his results have always been satisfactory. In chronic articular rheumatism he claims that it is the best agent known at this time. In acute febrile articular rheumatism it was of little value in adults, and quite useless in children. The local pain, however, was much diminished by its use. In acute cases of arthritis of the vertebral column it acted well, but in chronic cases it was of little value. He obtained very gratifying results in sero-fibrinous pleurisy (*Wien. Medizin. Blätter*, Vol. XXI, page 511).

Dr. Gilbert Lassere reports using this agent internally combined with sweetened whisky or rum to conceal its odor and taste. His success in both acute and subacute cases of rheumatism has been very gratifying. He has made use of it in 40 cases. Although he has used it in a few cases of gout, he claims that they are yet too few to make any definite statement, but its usefulness is quite apparent.

Drs. G. Linoissier and M. Lannois made a report, at a meeting of the Paris Academy of Medicine on March 22nd last, of their results after applying this agent locally to the unbroken skin of joints in rheumatic affections. They appear to prove that the action is due to actual absorption and not to inhalation. They rarely met with toxic effects and even when such did occur, they were only slight in character. They advise two applications a day in acute rheumatism. In infectious and gouty arthritis and other chronic, painful diseases like neuralgia, their results were frequently good although not universally so. They recommend that when the agent is applied the parts should be covered over with several layers of india-rubber cloth. They prefer this direct application rather than the use of any of the ordinary excipients, as they find the absorption is rather retarded by the use of such means. In concluding their treatment of the subject they append quite a complete list of references in the form of a Bibliography (*Bulletin de l'Académie de Médecine*, Vol. XXXIX, page 320).

Dr. Chambard-Hénou of Lyons, France, reported to the French Congress of Medicine at Montpellier, France, his results with the external application of this agent in cases of hepatic colic. He urged early application to obtain the best results. The quantity

employed each day may range from 6 to 7 grammes (92.6 to 108 grains) without bad effects. He also recommends that the part after the application is made be covered with rubber tissue. As early as half an hour afterward, some relief may be expected, and within an hour it is quite marked. His first results were so gratifying that he proposes to push this line of treatment further, and if possible substitute the older forms of treatment only when he fails with this local application.

Reports are made of its application to the vagina and cervix in cases of metritis or gonorrhea, with the result that the gonococci are destroyed.

"A rare instance of poisoning from oil of gaultheria occurred during the past week (October 15 to 22) in Bellevue Hospital, the first in the history of the institution, it is said. The drug was taken by the patient as a cure for drunkenness. The quantity consumed was not definitely made out, it being, according to the man's statement before he became unconscious, ten cents' worth. Some years ago there occurred in the wintergreen-distilling region of Pennsylvania a similar death, in which an insurance company raised the question of intent on the part of the insured. It was shown, however, that in the process of production a watery fluid was obtained which the workmen drank with impunity, but the oil was considered dangerous and the supposition was that a mistake had been made in the two liquids, making the suicide non-intentional." (N. Y. *Med. Record*, Vol. 54, page 594).

Methylene Blue (Tetra-Methyl-Thionine Chloride)—the anilin derivative—has been quite largely commented upon during the past year. It appears to be now pretty prominently recognized by most practitioners. The Monograph of Dr. Jean P. Cardamatis of Athens, Greece, on the treatment of malaria with this agent alluded to here last year, has been published in the *Deut. Medicin. Wochens.* (Vol. XXIV, *Therap. Beilage*, page 9), and it may therefore be alluded to a little more in detail at this time. He reports on 275 cases of its administration. The dose for adults varied from 650 to 800 milligrammes (about 10 to 12.4 grains). In his cases of typical intermittent fever he began administration 10 hours before the paroxysm. In remittent or continuous fevers, 8 hours before the remission. A combination of Quinine and this agent was often found of value when either one of the two failed. Out of his 275 cases he found only 30 needing the combination. He found the advantages of this agent were especially noted in cases where Quinine

was of little use or where an intolerance of it was met. The staining of the tongue and lips and a mild attack of cystitis were occasionally observed, which were the only inconveniences of any weight, and he claims that they are so insignificant in comparison with the good results obtained, that they may be quite ignored. A striking feature of treatment with this agent, is that although the convalescents continue to reside in the malarial district, very few are again attacked. In 18 cases the fever disappeared after the first day, in 36 after the third day, in 84 after the sixth day, in 88 after the tenth day, in 18 after the eleventh day and in 13 after the twelfth day. No cure was obtained in 18 cases. In 38 cases a relapse occurred after two months.

Dr. G. Richard D'Aulnay reports on its use both internally and by injection, in various affections of the urinary organs, and enumerates its special properties as follows: It is useful in epithelial nephritis by increasing diuresis and causing the albumin to entirely disappear. In cystitis, both internal administration and that by injection of a diluted aqueous solution resulted in marked benefit. It is an excellent germicide and analgesic and prevents fermentation (*Bulletin Gén. de Thérap.*, Vol. CXXXIII, page 353).

Dr. J. Castaigne has made quite a study of the subject of renal permeability, and has found that this agent approaches the ideal of permeable substances, therefore to those who may be interested in this line of study, it may be of service to record here that his conclusions may be found in the *Gaz. des Hôpitaux* (Vol. 71, page 617).

Dr. H. A. Tomlinson of St. Peter, Minn., read a paper before the Minnesota Valley Medical Association on December 7th last on the effect of this agent on the kidneys, and after alluding to the work of Drs. Archard and Castaigne, reports on his own six cases in which he found that Methylene Blue stained the functional part of the kidney but not the fibrous part. He regrets that he was not able to verify the selective affinity of this agent for the epithelial structure of the kidney by post-mortem examination, but it has been strongly recommended in the treatment of cancer, cystitis, gonorrhea and the like. He concludes that it showed special affinity for the functional parts. He feels constrained to report that with one or possibly two exceptions the patients have not been much benefited and that in the two cases in which improvement was quite marked, the nephritis was either parenchymatous or mixed. He is rather inclined to conclude from not only these six cases but others, that the parenchymatous cases are more apt to show improvement.

The general condition of the patients, however, in all cases showed marked improvement (*Northwestern Lancet*, Vol. XVIII, page 61).

Dr. Orville Horwitz of Philadelphia, Pa., read a paper before the Philadelphia County Medical Society on February 9th last on the special effect of Methylene Blue in the treatment of 105 cases of acute gonorrhea, giving special reference to its germ-destroying action on the gonococcus. He reports that he found the best results were obtained by combining Copaiba, Sandalwood and Salol, administered in capsules according to the following formula :

Methylene Blue	130 milligrammes (2 grains)
Oil of Sandalwood	195 " (3 ")
Oleoresin of Copaiba	195 " (3 ")
Oil of Cinnamon	1 drop

" When this combination was administered, the purulent discharge, together with all inflammatory symptoms, usually disappeared within four or five days."

He feels warranted in making the following conclusions :

" (1) That methylene-blue is a germicide of great value in cases of acute urethritis, due to the presence of gonococci.

(2) That it will not abort the disease, but will materially shorten its duration.

(3) That it markedly lessens the tendency to complications.

(4) That it is not to be employed in the treatment of acute urethritis, unless a bacteriologic examination demonstrates the existence of gonococci.

(5) That the remedy should be employed as soon after the infection as possible.

(6) That the proper dose with which to begin treatment is one grain three times daily, to be increased to two grains if the remedy is well borne.

(7) That the beneficial action of methylene-blue is enhanced and the duration of the disease is shortened by combining it with copaiba, sandalwood, and salol.

(8) That the injections of potassium permanganate by means of a hard syringe, or if possible by irrigation, administered in the early stages of the disease, and followed during the period of decline by an astringent injection, have a marked tendency to lessen the duration of the malady.

(9) That methylene-blue always has the effect of turning the urine to a deep blue color. Of this fact the patient should always be informed to prevent unnecessary alarm.

(10) That methylene-blue is of no service in cases of non-specific urethritis.

Irrigation of the urethra with methylene-blue in cases of acute gonorrhea is now being made the subject of investigation by the writer, but as yet he has not elaborated sufficient data to enable him to submit the result of his research to the profession." (The *Phila. Polyclinic*, Vol. VII, page 113).

Dr. Estay has made a report (*La Médecine Moderne*, Vol. 9, page 53) on two cases of diabetes mellitus treated by him with benefit with this agent. The first case was a 53 year old man who continued to pass 2500 Cc. of urine each day, containing 60 grammes of sugar for each litre. Dr. Estay administered one-half gramme (7.7 grains) of Methylene Blue each day. In 8 days after beginning the treatment the sugar had diminished one-third and at the end of 5 weeks had almost disappeared. The amount of urine had been reduced to 1500 Cc. and the prevailing thirst had gradually diminished. In his second case he was enabled to reduce the excretion of sugar from 30 grammes for each litre, down to 5 grammes at the close of one month. In this case 0.1 gramme (1.5 grain) of this agent was given 4 times each day.

Dr. Alfred Fröhlich of Prof. Nothnagel's Vienna Clinic reports on a test for glucose in urine by means of this agent. The results of his demonstration will be found in the *Centralblatt für Innere Medicin* (Vol. 19, page 89).

Naphthalan is the name given to a proprietary article made by dissolving from $2\frac{1}{2}$ to 4 per cent. of anhydrous soap in purified petroleum naphtha. It is presented in the form of a thick blackish-green jelly which melts at 70°C. (158°F.). It is claimed to be obtained from a petroleum spring of the name adopted for it which exists in the Caucasus. It is reported to be quite miscible with vaselin and like excipients. It is quite soluble in the ordinary solvents except water, in which it is insoluble. Air seems to act upon it, therefore the caution is expressed that it should be kept in well-corked bottles. By some observers it is classed as an analgesic, antiphlogistic, antiseptic and reducing agent. It is claimed to have no toxic effects and is readily absorbed through the skin.

Nothing has been heard from it in this country, but clinical reports come from Europe of its being an efficient agent in arthritis and rheumatism by local application. It has been chiefly used in the treatment of eczema, psoriasis, ringworm, scabies and other parasitic affections. The only thing apparently to be strictly

observed, is that it should not be rubbed into the skin too violently, as such is apt to produce the so-called "tar-acne." Dr. Pezzoli has used it clinically in 42 cases of eczema in all stages with much promise. In 15 cases of impetigo contagiosa he obtained excellent results. In cases of scabies only three applications were found necessary to obtain satisfactory results.

Dr. Friedrich Rosenbaum of Tiflis, Russia, reports on its marked efficiency in most all inflammatory processes in which he includes certain skin affections. He details three cases of local gangrene which were treated by this agent in the form of a powder, and noted its marked deodorizing effects almost immediately. He alludes in his report to an ulcerative process called "ulcus tropicum" which he states is prevalent among the inhabitants of Russia beyond the Caspian Sea. He states the microbic origin of this affection has been definitely established, but heretofore no treatment has been satisfactory. Now when using this agent in one case after others had failed, he finds that the annoying itching disappeared at once and complete healing occurred in 14 days, although the regular course of the disease is generally one year. Of course this one case does not necessarily establish its general efficiency, but it encourages one to carry on the observations further. He reports also an obstinate case of psoriasis of the scalp in which local treatment with this agent in the form of an ointment responded almost at once. He expresses satisfaction with his results in the treatment of frost bite of the extremities. He explains that it produces hyperæmia and prevents the threatening gangrene. In cases of burns it acts as an anodyne (*Deut. Medicin. Wochensch.*, Vol. XXIV, *Therap. Beilage*, page 28).

Naphtalin (Naphthalene)—one of the hydrocarbons obtained from coal-tar—has been little commented upon specially during the past year, although it is surely still much used.

Naphtol (β -Naphtol) still much used although not much commented upon, is quite a valuable intestinal disinfectant. It is being used in Europe, particularly in cases of pyloric obstruction, tuberculous ulceration of the bowels and typhoid fever. Also it is being used still as a very energetic germicide externally in the form of a 20 per cent. ointment in the treatment of itch and ringworm. It has been substituted with good effect for tar in the treatment of psoriasis, eczema and other skin affections. Some observers have thrown out the caution that it is not entirely free from toxic properties when used in large quantities. Fatal inflammation of the kidney has resulted in some cases reported.

It is thought of sufficient value to be worthy of official recognition, and therefore it is one of the few new articles added to the British Pharmacopœia just issued.

Naphthoxol is the name given to a mixture of a 2 per cent. alcoholic solution of Naphtol and a 3 per cent. Solution of Hydrogen Dioxide. It is recommended as a powerful germicide in the treatment of wounds. It is spoken of in connection with Menthoxol and Camphoroxol, and the claim is made that any one of these three solutions undiluted will kill anthrax spores within three hours, which could not result with the ingredients separately. Dr. Wagner of the Charité Hospital of Berlin, Germany, reports its use in 200 surgical cases by applying a 10 per cent. solution on sterilized gauze. It has no irritating properties, is an efficient deodorizer and has an agreeable odor (*Deut. Medicin. Wochenschr.*, Vol. XXIII, *Therap. Beilage*, page 74).

Nosophen (Tetra-Iodo-Phenol-Phthalein)—the Iodoform substitute—is still before the profession and is being used to quite a large extent. However preference over Iodoform is not given to it in most cases. In general it is recommended equally with Iodoform, showing that the surgeon is undoubtedly anxious to favor anything which has any advantage over Iodoform, and yet not willing to give the latter up entirely.

Orexin (Phenyl-Di-Hydro-Quin-Azoline)—the appetite promoter and stomachic—continues to be used, and the hydrochlorate has been practically retired for reasons previously given. Pharmacists are now offering a chocolate tablet of this agent which seems to be an attractive form to administer it.

Dr. Friedrich Kölbl reports having had favorable results in the treatment of chlorosis and anemia, in anorexia existing among convalescent patients after a very severe illness. Again in cases of nervous dyspepsia, hysteria and neurasthenia. His results were very gratifying also in relieving the vomiting in pregnancy after a few days' administration. He finds it to be contra-indicated in quite all cases of acute inflammation and ulcerations of the mucous membrane as well as in all cases of hyperacidity and hypersecretion of gastric juice. The favorable time to administer this agent he finds to be about one hour before dinner and supper, and warm liquids should rather be avoided immediately after its administration. His cases of chlorosis were 9 in number, his convalescent patients 4 and his neurasthenics 4. He gave 500 milligrammes (7.7 grains) in the

form of a wafer to 9 healthy persons, from which he noted very definite beneficial effects and no ill-effects.

The Tannate of this agent has now been brought forward with some advantages claimed for it. It is a yellowish-white, odorless and almost tasteless powder quite like Calomel in general appearance, soluble in water and insoluble in dilute hydrochloric acid, and therefore would probably be of service in the stomach, stimulating the acid secretion. It has been employed in cases of pulmonary tuberculosis, anemia and chlorosis in the same class of cases as basic Orexin. It has behaved well in the treatment of anorexia in children, particularly accompanying an attack of diphtheria, and in some quarters has gained quite a reputation from this one particular class of patients. It appears to be most valuable in the functional affections of the stomach, rather than the organic ones.

Dr. Ferdinand Steiner of Vienna, Austria, has now made a report on the use of Orexin Tannate in over 100 cases of anorexia of various kinds in children. He reports that with very few exceptions the children who refused to eat before even after some force was brought to bear upon them, seemed to long for their food after the administration of this Tannate. On an average it took five days' consecutive use to bring about this result, but when once established, the appetite seemed to continue for quite a length of time. For children between the age of 3 and 12 years his rule was to give 500 milligrammes (7.7 grains) two hours before dinner and supper (*Wien. Medicin. Blätter*, Vol. XX, page 767).

Orphol (β -Naphtol Bismuth)—recommended as an intestinal antiseptic—has not been alluded to under its own head during the past year, but, as was stated on a previous occasion its effects are those of β -Naphtol, it no doubt is classed under that one general head.

Orthoform (Methyl Ester of π -Amido-*m*-Oxy-Benzic Acid), the new synthetic local anæsthetic constituted like Cocaine, has received much attention during the past year. It has evidently come to stay. Its comparative freedom from poisonous effects give it a long lead over Cocaine. Its hydrochlorate has been found to be too acid to use hypodermically or as an application to the eye. Its internal administration, however, both by the mouth and in urethral injections is quite effective. Orthoform itself is insoluble in water, but after violent shaking in water it is divided up into such small particles that they can be injected hypodermically

with a somewhat large needle. The pain attending the passage into the tissues has been counteracted by a preliminary injection of a small quantity of Cocaine. Dr. Hirschbruch of Posen, Prussia, has made a report on its hypodermic use as an anæsthetic for minor surgical operations. His general plan is to first inject under the thick part of the skin the equivalent of one division of his hypodermic syringe of a 2 per cent. solution of Cocaine Hydrochlorate (representing 2 milligrammes ($\frac{1}{36}$ grain) of the salt.) A small bleb results from such a puncture into which at several points he injects under the subcutaneous tissue 1 Cc. (16.2 minims) of distilled water containing in suspension 3 per cent. of Orthoform, taking the precaution to shake the syringe well before each injection in order to distribute the small particles uniformly throughout the water. A very few minutes only is required to produce a complete and lasting local anæsthesia (*La Semaine Méd.*, Vol. 17, page 476).

Dr. Isidor Dreyfus of Ottweiler, Prussia, reports on the use of this agent to counteract the burning sensation experienced at the seat of an operation when Schleich's method of local anæsthesia by infiltration is employed. He accomplishes this result by dusting the Orthoform on at that locality (*Muench. Medicin. Wochensch.*, Vol. XLV, page 527).

Dr. Kallenberger of Munich, Bavaria, reports upon his use of this agent in his surgical practice. He observes that it acts well as a local anæsthetic whenever sensory nerve filaments are exposed; it is non-toxic to such an extent that he reports having used as much as 4 grammes (about 60 grains) in the course of one week upon a large raw surface; it is quite antiseptic in its action. He has employed it in fresh wounds, in burns, in ulcers of the leg, in carcinomatous ulcers, in syphilitic ulcers and in toothache where the nerve ends were exposed. In from three to five minutes the local anæsthesia was complete and lasted in his experience on an average of thirty-five hours. He employed this agent in the form of an ointment to the best effect when an exudation was abundant, for the usual powder form would be washed away. He speaks of others having used a chloride of this agent for internal administration, but expresses the opinion that it would not do for surgical purposes on account of its irritating properties (*Berlin. klin. Wochensch.*, Vol. XXXV, page 261).

Dr. Eugene S. Yonge read a paper before the Manchester (England) Therapeutical Society on "The Local Treatment of Painful Ulcerations by Orthoform, with Special Reference to the Upper

Air Passages," in which he enumerates his treatment of 18 cases and concludes as follows :

"Finally, if further observations confirm the results already published, it would appear that orthoform is entitled to take a position in the gamnt of local anæsthetics applicable to the upper air passages. It seems probable that it will replace—by virtue of its insolubility and innocuousness—its relative, cocaine, when long anæsthesia on ulcerated surfaces is wished for ; be replaced by the more reputed drug when short insensibility of intact mucous membrane is desirable, and on occasion supplement it." (*Brit. Med. Journ.*, Vol. I for 1898, page 362).

Dr. R. Blondel of France has reported to the Paris Academy of Medicine his results after various applications of this agent in gynecology, especially where he desired to produce local anæsthesia on the uterus in the treatment of endometritis and in curetting. One series of his cases consisted of 50 patients who were treated successfully for endometritis in an average period of three weeks. He used in these cases Orthoform suspended in the glycerin employed to saturate his antiseptic gauze, which was introduced into the uterine cavity. In cases where curetting was called for he packed the uterine cavity with Orthoform gauze an hour before he was to operate, which made the subsequent operation painless.

Dr. Max Mosse of Berlin, Germany, reports on his six months' experience with this agent in a paper on the behavior of Orthoform in the organism. His object was to determine whether it was excreted in the same form in which it was administered. The reactions obtained in the urine were the same as in the original article before administering, but Orthoform itself cannot be separated from the urine. Thus some closely allied product must be excreted, (*Deut. Medicin. Wochensch.*, Vol. XXIV, page 405).

Dr. H. Neumeyer of Munich, Bavaria, reports his results after its use in painful affections of the upper air passages, such as tuberculous ulcerations of the larynx ; in minor operations where it is used as a local anæsthetic ; in simple or malignant gastric ulcerations where pain exists ; in cases of pain occurring throughout the urethral tract ; in painful skin affections and in neuralgias occurring in tabes and the like. He has found that even one application often counteracted the pain for hours and even days. He has observed that it must be applied directly to the ends of the nerve filaments to produce its beneficial results. In neuralgias generally it had little effect. He observed that Cocaine excels Orthoform when

applied to the mucous membrane of the air passages where the latter was intact, but when ulcerated and the nerve ends were free, Orthoform was far superior and lasting effects were produced. He noticed that a slight burning sensation, locally, occurred occasionally, but lasted a very short time. He observed that the sense of touch, of heat and cold and of taste are not affected by this agent (*Muench. Med. Wochensch.*, Vol. XLIV, page 1230).

Paraldehyde (officinal) although much in use has not been noted specially in the medical literature of the year.

Pellotin (the alkaloidal principle contained in the species of Mexican Cactus known botanically as *Anhalonium Williamsii*) the new hypnotic of last year has not been heard of in the current medical literature of the year.

Peronin (Hydrochlorate of the Benzylic Ether of Morphine) proposed as a substitute for Morphine is still before the medical profession and used in the same class of cases as alluded to here last year. Dr. M. Eberson of Tarnów, Austria, reports his results in five cases of acute bronchial catarrh, three cases of chronic bronchial catarrh, five cases of pulmonary tuberculosis and three cases of pertussis. As a sedative his results were quite favorable. His adult dose varied from 10 to 20 milligrammes ($\frac{1}{6}$ to $\frac{1}{3}$ of a grain) four times a day, taken either in syrup, as a powder, in tablets or in cachets. Some of these means as well as others he recommends, should surely be adopted to mask the bitter taste, and the burning sensations in the throat should be prevented. He found that the appetite, the general circulation and general condition of the patients were not affected. Its action was such that without hindering the expulsion of the expectoration, it lessened the amount considerably, and proves to be in his hands a most valuable substitute for Morphine. Its action in acute bronchitis was rapidly effective. The irritation of coughing, the expectoration and the sleep in chronic bronchitis and pulmonary tuberculosis were markedly improved. The digestion was unaffected and it proves to be non-toxic even after long use. He feels called upon, however, to make one exception concerning its toxic effects in the case of a child two years old who exhibited drowsiness. In one particular case of hysterical cough and three of pertussis his results were extremely gratifying (*Therap. Monatsk.*, Vol. XI, page 591).

Dr. A. Mayor delivered an address before the Société Méd. de Genève on May 4th last giving the results of his investigations. He used it clinically as a substitute for Codeine in doses varying

from 20 to 40 milligrammes ($\frac{1}{3}$ to $\frac{2}{3}$ of a grain) two or three times each day to alleviate the cough in pulmonary tuberculosis, chronic bronchitis and pertussis. He also finds that it does not produce sweating nor dyspepsia. His conclusions are that its action approaches closely that of Codeine, even more so than any other alkaloid, and based on experiments upon rabbits it has only a slight narcotic action. Even when the dose is increased it does not produce a narcosis but convulsions, which he claims are not spinal in origin as those of Strychnine, but are cerebro-bulbar in origin and produce death by asphyxia. The dose to produce this appears to be four times less than in the case of Codeine. After artificial respiration has been kept up death results from heart stoppage which proves it to be a cardiac poison. He thinks it very worthy of note that such a feebly narcotic alkaloid should allay a cough almost as effectually as Morphine (*Revue Méd. de la Suisse Rom.*, Vol. XVIII, page 315).

Dr. Meltzer has published his conclusions in relation to this agent as follows, practically confirming previous observers: In doses varying from 40 to 100 milligrammes ($\frac{2}{3}$ to $1\frac{1}{2}$ grains) it acts like Morphine but has none of the unpleasant sequelæ. He places its hypnotic action relatively between that of Morphine on the one hand and such hypnotics as Paraldehyde, Amylene Hydrate, Sulphonal, Trional and the like on the other. He finds only two prominent disadvantages and they are its difficult solubility and disagreeable taste. To overcome the first he suggests the following mixture:

Peronin	2.0	grammes.
Saccharin	0.5	“
Rectified Spirit.....	100.0	“
Water.....	900.0	“

He cautions all to observe that the above is a mixture and not a solution, and that the bottle must be shaken before each dose is taken.

Pharmacopœias as standards for the medical as well as the pharmaceutical profession have received much more attention in the current professional literature than in the year previous, chiefly for the reason that one of the standard works of the world—the British Pharmacopœia—has recently been published, the work having been finally completed after much study and investigation. An attempt was made in this Revision to give it an Imperial character

in which every colony and dependency would have a voice in the work accomplished. The complete results are not what many of the Colonies had expected, but possibly as much has been done in that line as could be, taking everything into consideration, for it is proposed to issue in about two years an appendix giving a few alternative formulæ in certain preparations, which may be made in the Colonies. The new work is undoubtedly a great improvement, both from a medical and pharmaceutical standpoint, over the previous Revisions. The pharmacists have had a larger representation in the work done than ever before. One hundred or more experts have had something to do with the work as it was divided up so systematically that each group of workers could work independently and turn in their results to be harmonized by the general body. A defect which might have been avoided is the question of the date of its enforcement. It has previously been the rule that when an advertisement appeared in the *London Gazette* stating that the new Revision had been published, the date of that issue was the date of enforcement and the use of the new work became compulsory. It is now proposed, however, to allow a few months to elapse before its enforcement in order that a thorough study may be made of the changes, and not only physicians and pharmacists, but manufacturers adjust themselves to the new conditions. The limit of such interim has not yet been announced. It proves to be a much more indispensable guide both to the practitioner and the student in medicine, than the United States Pharmacopœia, chiefly by having incorporated in it a few features which make it more of a reference book for them. The metric system has been used for the first time in the formulæ and placed alongside of their old standard weights, but it will be noted that the metric weights and measures are not the equivalents of the Imperial ones and in carrying out the formulæ according to the two systems very different quantities of the preparation are produced. It is unfortunate that the doses are only expressed in apothecaries' weights, for physicians will now have little chance to become accustomed to the metric system as they rarely consult the formulæ for any practical purpose. A marked improvement has been made in the way of simplifying the dose question. The methods of preparation of the various articles have been so modified as to enable numerous classes of preparations to be given in doses based on some definite plan. All tinctures, for instance, taken as a whole, can be given in either large or small doses. All preparations possessing active properties would

naturally be of the small dose class and likely to produce poisonous effects, therefore it is so arranged that this class all have quite uniform doses. For instance Tincture of Digitalis and Tincture of Strophanthus—alternates in their action—are by this new Revision given in the same dose. The class of preparations which are given in large doses are grouped together in a similar way. The plan which was adopted by the revisers of our present U. S. Pharmacopœia of so relaxing the requirements of the mode of manufacture by a prescribed formula, has been adopted by the revisers of the British Standard, so that a particular process is quite optional. The quality of the finished product must, however, always come up to a fixed high standard, and there has been no relaxation of the standard of purity. The principle of standardization has been used to a greater extent, but not as fully as was expected by many when the Revision was first undertaken, for the reason that it was found quite impracticable to make it anywhere near general in its application. To those who only view the question quite superficially it would seem that standardization was the only proper plan to follow out completely, but when it is remembered that the amount of alkaloidal principles are not uniformly in direct and constant ratio to their therapeutic activity, it becomes evident that the application of such a principle cannot be made general, for the reason that medical knowledge does not keep pace with chemical. Among the additions acknowledged now in this Revision are a class of preparations called Concentrated Vegetable Liquors (“Liquores Concentrati”) for which it is hard to realize the practical reason. They seem to be something like a cross between the tinctures and fluid extracts and evidently aim to represent concentrated infusions, so-called.

Another prominent addition is the recognition of the Thyroid Extract. A “Thyroid Solution” has been introduced also and is described as “a liquid prepared from the fresh and healthy thyroid gland of the sheep.” The characters of this solution are described as follows: “A pinkish turbid liquid, entirely free from any odor of putrescence. It must be freshly prepared, and kept in well-stoppered, sterilized bottles. 100 minims (or 6 cubic centimetres) represent one entire thyroid gland.” The dose is from 308 to 924 milligrammes (5 to 15 minims).

The revision of the German Pharmacopœia is now in progress, for the Committee on Revision have already met in session and is undoubtedly at work.

A supplement to the 1893 edition of the Danish Pharmacopœia—the last edition—was published early this year and contains formulæ of some of the newer synthetic products.

A new Venezuelan Pharmacopœia was issued during the first half of this year. The Spanish language is still employed, but the synonyms are given in Latin. Many of the newer synthetic products are included in its pages.

In preparation for the approaching revision of the U. S. Pharmacopœia in 1900 much work is being done every day. The hold-over Revision Committee which is in existence is hard at work, and will be ready to render valuable service when the publication is to be taken up. Many valuable points can be learned now from the latest revision of the British Pharmacopœia.

Phenacetin (Para-Acet-Phenetidin) continues to be the same widely-used antipyretic and analgesic of previous years, and calls for little special comment.

Phenocoll (Amido-Para-Acet-Phenetidin)—the antipyretic—used practically always now in the form of Hydrochlorate is still employed quite largely. It is used almost exclusively in the treatment of malaria. Italy seems to be a field in which noted success is obtained.

In Algiers the Government have undertaken to investigate its efficiency in the treatment of intermittent fever as found in the hospitals there. Cases which have not responded to Quinine are found to act favorably with this agent, and often where its antiperiodic effect seems lacking, its action as an anodyne is beneficial.

A few cases of dangerous collapse have been reported from the French Army after using this agent (*La Semaine Méd.*, Vol. 17, Annexes, page CCXIV).

Dr. V. Dall'Olio reports his conclusions upon the use of this agent as follows: He finds it to be an excellent antipyretic, analgesic and antirheumatic agent; it gives excellent results in long-standing cases of malarial fever which have not responded to Quinine; it reduces the size of the spleen in malarial affections; it has given him good results in chorea, in pertussis and in various forms of febrile affections; he finds it unobjectionable to most children as well as adults, especially when the taste is masked by the addition of syrups or other expedients (*Gaz. hebdom. de Méd. et de chirurg.* Vol. XLV, page 175).

Phesin (the analogous antipyretic to Cosaprin) has not been heard of in the current medical literature of the past year.

Piperazin (Di-Ethylene-Di-Amine) has been little commented upon during the past year. The most prominent mention was that of Dr. Reynold W. Wilcox of New York City, who spoke of it in his paper on "A Phase of the Treatment of Goutiness" (*Medical News*, Vol. LXXI, page 684). He relates three of his cases in which he obtained very satisfactory results from the use of Piperazin Water and concludes as follows :

"So far as my knowledge goes piperazin water is the method of choice for the administration of this drug, because perfect solution in proper dose and quantity of menstruum is obtained.

It may then be concluded : (1) That uric acid, as a causative factor in neurotic lithemia, a form of goutiness, should not be overlooked. (2) That a limited meat diet is productive of good results. (3) That piperazin administered in the form described in this paper is the remedy of choice for the elimination of uric acid, not only in this, but in other pathologic conditions dependent upon the same cause.

Poison Ivy. Dr. A. T. Hudson of Stockton, Cal., writes to the *N. Y. Medical Record* (Vol. 54, page 173) on "An Antidote to the Rhus Poison" as follows :

"In the *Medical Record* for April 16, 1898, is an article on Rhus toxicodendron, by Dr. Louis F. Frank, of Milwaukee, Wis. The author speaks of many remedies but gives no preference to any. This probably is no oversight, for I find such is the general tone of authors on the subject.

A few years ago my son put a Chinaman to clearing a piece of ground which was infested with a thick growth of poison oak, *Rhus diversiloba*, which had to be handled and burned. After one day's work the Chinaman reported sick, with hands and face swollen and painful. Remedies from the nearest doctor were obtained and applied. A carpenter who was working about the place was afflicted also. His eyes were closed and very painful. The medicine at hand was used on both patients for several days, with no relief. My son then sent to me, a hundred miles distant, for treatment. I ordered muriate of ammonium, one ounce, to be dissolved in two quarts of warm water. This solution was to be applied with cloth or absorbent cotton, covered with oil silk or rubber tissue. Relief followed quickly and in two days the sufferers were well or able to work.

Ten days later my son, after working a day with the shrub, found at night that his hands were swelling and inflamed. He applied the

remedy at once, and by the next morning there was positive arrest of the malady. By frequent washing with the solution he and the others were not troubled thereafter.

Dermatitis venenata is usually self-limited, although the limit may be twenty-four hours, or as many days; hence the long list of uncertain remedies. Any medicine which will relieve pain and arrest morbid progress promptly is a remedy much needed.

The above cases and a history of many others might be cited to show that this drug, hydrochlorate of ammonium, is a pleasant and efficient curative and prophylactic."

Protargol is the name given to a new silver compound consisting of 8.3 per cent. of Silver combined with Protein and prepared in that unlimited storehouse of new products, Prussia. It is presented in the form of a light yellow powder quite readily soluble in water, which solubility is found to be furthered by first slightly sprinkling the powder before the bulk of the water is added. It makes a comparatively clear, light brown solution and may be prepared up to 50 per cent. This solution is neutral and does not decompose when heated. It, however, turns a dark brown if the heat be continued for any length of time. If concentrated hydrochloric acid be added to the solution it produces a precipitate of Protargol itself and not of silver chloride as would be the case in the ordinary silver salts. This property is of much value in its physiological action. The combination between the Silver and Protein is so close and forms such a stable combination of Silver that practically no irritation results when it is used as an antiseptic. It acts also as a very effective bactericide and by some is claimed to be superior to its allies Argonin and Argentamin. Its better results are explained in that it contains a larger proportion of Silver, for the Argonin contains only 4.2 per cent. and the Argentamin only 6.3 per cent. It has been used with good results in as dilute solutions as one-quarter of 1 per cent. in the treatment of acute gonorrhea. The strength has been rapidly increased up to from 1 to $1\frac{1}{2}$ per cent. with good effect. Even 5 to 10 per cent. solutions have been used in the treatment of urethritis in females and little irritation was experienced. In general the results were found to be better and more prompt with this agent than with any other used for the same purpose. Prof. A. Neisser of Breslau, Prussia, reports that he has never used a remedy which gave him better results. He used it in 150 cases in his surgical practice, as a dressing on wounds. In cases of phlegmonous inflammation a 5 per cent. solution as a

moistening liquid on the dressing proved very efficacious. The powder was used in all recent wounds. An ointment was used in quite a series of ulcerations and a 5 per cent. solution was applied in the treatment of tonsillitis.

In "A Contribution to the Treatment of Gonorrhea" Dr. Hermann Goldenberg puts the matter very compactly as follows: "We are indebted to Neisser for the introduction of the nitrate of silver for this purpose, which for a long time has been a favorite means for the destruction of the gonococcus. As the effect of this drug is only superficial, owing to its forming insoluble combinations with albuminous substances, and as the gonococcus penetrates at an early period into the deeper layers of the epithelium—and even into the connective tissue—the physician has long been desirous of obtaining a silver compound which would not form insoluble, and consequently inert, albuminates.

Recognizing this want, synthetic chemists have endeavored to prepare silver compounds which would be free from this disadvantage, such as argentamine and argonin. Although it must be conceded that these preparations exhibit a more penetrating effect than nitrate of silver, and must be regarded as valuable acquisitions, I have, during the past few months, become familiar with a new silver salt which has proved even more effective. This remedy, known as protargol, is a light yellow powder, readily soluble in water, containing 8.3 per cent. silver in firm combination with a highly diffusible proteid base. Its solutions, which are clear and of neutral reaction, are not precipitated by alkalies, albumin, or acids, and hence its effect is not interfered with or impaired by the presence of these substances. It is advisable to preserve the solutions in dark bottles. Owing to its chemical constitution, its combination with a highly diffusible base, there is reason to believe, *a priori*, that it exerts a more penetrating effect than any other compound yet brought before the profession." He goes on to state later that he intends "to try gelatin urethral bougies of protargol as soon as I can have them made in the proper manner." These he obtained later and no doubt is working with them at this time. He closes his article as follows: "In conclusion, I can but confirm the statement of Neisser that no other remedy gives such uniformly good, reliable, and quick results as have been witnessed from the use of protargol." (*N. Y. Med. Journ.*, Vol. LXVII, page 119).

Mr. J. Ernest Lane of London, England, in writing up the subject of Protargol as noted in the Abstracts on Venereal Diseases

in the London *Practitioner* (Vol. LX, page 310), expresses himself as follows: "The experience of the writer, though at present limited, on the use of protargol goes far to confirm the favorable opinion expressed by Neisser, especially with reference to its powerful antibactericidal properties."

Dr. E. Wood Ruggles writes from Berlin to the Editor of the *Medical News* expressing his desire "to make the medical profession acquainted with the results attending the use of protargol in gonorrhea in the polyclinic of Drs. E. Frank and A. Lewin at Berlin." Those desirous of completing their reading on this new agent will be interested therefore to read the report of Dr. Ruggles as found in the *Medical News* (Vol. LXXII, page 404).

Dr. Gustav Behrend has published a "Preliminary Report Upon the Action of Protargol in the Treatment of Gonorrhea" (*Berlin. klin. Wochensch.*, Vol. XXXV, page 304) in which he disagrees with Prof. A. Neisser, for his experience would show that it was not the best bactericidal agent. He differs also with Dr. E. Frank who claimed that he found the urethra free from gonococci in from one to three days. Dr. Behrend's cases number 14 and show results at variance with the professed authorities. He found the gonococci in the discharges from the urethra in from three to five weeks after he began the treatment. In one case he is obliged to report very decided inflammatory reaction occurring after injections had been made. His experience rather sides with the use of astringents as being equally effective, but he does not intend to give up the new treatment just yet. His argument is that the Protargol only acts upon the gonococci which it comes in contact with as it does not penetrate the tissues. Those gonococci therefore unattacked by this agent are permitted to remain and increase. Dr. Behrend's claims, however, are met by very pronounced refutations from more than one observer, basing their conclusions upon many months' use and quite a series of cases.

Dr. L. Fürst of Berlin, Germany, reports that he has had excellent results in 36 cases of gonorrhea; 14 of these were of the neck and body of the uterus, 8 of the cervix, 5 of gonorrheal urethrocystitis, 3 affecting the vulva, 3 of inflammation affecting Bartholin's gland, 2 of gonorrheal endometritis and 1 affecting the vagina alone. He uses a $\frac{1}{2}$ per cent. solution in irrigating the uterus, for instance, and gradually increases the strength up to 2 per cent. He follows this by inserting a soluble bougie of Protargol containing from 5 to 10 per cent. into the cervix, and after it has done its

work he irrigates the vagina with a 10 per cent. solution, following the whole up by inserting a glycerin tampon containing 10 per cent. of Protargol. After the second week of this treatment he applies astringents which finish the treatment completely in three weeks. He has also had excellent results in the treatment of gonorrhoeal ophthalmia with this agent.

Dr. Ed. Pergens of Brussels, Belgium, has made a report on his use of this agent with which he is much pleased. He expresses surprise at the claim of some that a solution of this agent does not stain linen, for he finds it does. He has employed solutions varying from 2 to 10 per cent. and occasionally he has used a 20 per cent. solution followed by no pain or irritation. In cases of acute conjunctivitis he dropped the solution in the eye from three to twelve times a day, and in cases where suppuration of the lachrymal sac occurred he found good results to follow a syringing out with a 10 per cent. solution. His results were not so good in the chronic forms of conjunctivitis with hyperplasia (*Klin. Monatsh. für Augenheil.*, Vol. XXXVI, page 129).

Other observers in this line of practice have obtained as satisfactory results. They note that whereas it may be less energetic than Silver Nitrate it does not cause any irritation or smarting and is a safe solution to leave in the patient's hands for application at home.

Dr. A. Darier recommends an ointment as the best form in which to apply this agent externally, in the following proportions :

Protargol.	1.5 grammes (23.2 grains)
Zinc Oxide.....	1.0 “ (15.4 “)
Starch.....	1.0 “ (15.4 “)
Vaselin	15.0 “ (231.5 “)

This he would apply to the eyelids in cases of blepharitis and blepharo-conjunctivitis (*Wien. klin. Rundschau*, Vol. XII, page 97).

Dr. Deneffe of Brussels, Belgium, has reported to the Belgium Royal Academy of Medicine the results of his practice in the use of this agent in ophthalmology. He not only acknowledges that it is fully as effective as Silver Nitrate, but in some ways superior to it. He finds it to be surely a more effective bactericide and has far greater penetrating power (*Bull. de l'Académie Royale de Médecine de Belgique*, Vol. XII, page 190).

Dr. Frederick E. Cheney of Boston, Mass., has published a paper on “Protargol as a Substitute for Nitrate of Silver in Ophthalmia

Neonatorum and other Conjunctival Diseases" (*Boston Med. and Surg. Journ.*, Vol. CXXXIX, page 194) as a result of his observations on 25 cases of the first affection and several cases of gonorrheal and non-specific conjunctivitis.

Pyoktanin (Methyl-Violet)—the analin dye "pus destroyer"—continues to be little commented upon although undoubtedly much in use. It has been recently suggested that it has a valuable application as quite an accurate means of diagnosing posterior urethritis. The plan adopted is to wash out the urethra thoroughly with about a 1 per cent. solution of Boric Acid, then inject a solution of Pyoktanin of about one-quarter to 1 per cent. strength, directing the patient to retain it for about five minutes, after which the urethra is washed out as before until the solution passes without color. The patient is then directed to pass whatever water there may be in the bladder and the color of the filaments passed are noted. If they are violet in color it would indicate that they have come from the anterior part of the canal, if colorless, from the posterior part. The practical objection to the plan has appeared to be the inability of the patient to retain the solution for as long as five minutes.

Dr. Alfons Hanč of Vienna, Austria, has made successful use of injections of this agent in malignant growths of the bladder which he could not operate upon for various reasons. The strength of his solution to begin with was 1 in 5000 and it was increased slowly (*Allegemein. Wien. medizin. Zeitung*, Vol. XLIII, page 163).

Dr. R. E. Graham of New York City has written an article on "The use of Pyoktanin in the Treatment of Cystitis" (*N. Y. Medical Journal*, Vol. LXVII, page 889) in which he enumerates four cases. He claims that it can be applied to the most delicate mucous membrane not only in concentrated solution, but in powdered form, with but slight if any irritation.

"As a germicide and antiseptic pyoktanin stands high in the list. It destroys the vitality of anthrax bacilli in solutions of 1 to 1000, and retards the development of pus cocci in solutions of 1 to 2,000,000. Pyoktanin, when applied to an inflamed mucous membrane, stains the same intensely blue; this color remains for a number of days, and, of course, the pyoktanin is active as an antiseptic as long as any color remains."

Pyramidon (Di-Methyl-Amido-Antipyrin)—one of the new substitutes of last year for Antipyrin—has been followed up during the past year with some success. A report comes from the Clinic of Dr. R. von Linbeck of Vienna, Austria, where it has been tried

in 100 cases of various diseases, and the results appear to confirm previous ones. In 32 cases out of 40 of chronic tuberculosis its antipyretic effect was extremely satisfactory. In 9 cases of articular rheumatism it has quite displaced the use of Salicylic Acid where the latter cannot be tolerated. Its effect seemed to be specific in rheumatism when given in fractional doses throughout the day amounting in all to a total of 1.5 grammes (23.2 grains). In migraine, trigeminous neuralgia and like nervous pains its analgesic effect was very marked, and it is strongly recommended to extend its use in this line. In chronic rheumatism it seems to be of little value and absolutely of no value in malaria and nervous tachycardia. In two cases of tuberculous patients there was distinct intolerance (*Wien. klin. Wochensch.*, Vol. X, page 964).

Dr. Arnold Brandeis of Prague, Bohemia, makes a report of his results in 8 cases of typhoid fever in which he used this agent. He reports it to be a much slower and milder antipyretic than Antipyrin although its effects are more lasting. He has had some unpleasant symptoms among his cases, such as profuse perspiration, a weak pulse and even collapse, with doses varying from 100 to 225 milligrammes ($1\frac{1}{2}$ to $3\frac{1}{2}$ grains) (*Prager Medicin. Wochensch.*, Vol. XXII, page 525).

Dr. Rudolf Laudenhimer of Leipzig, Germany, reports the results of his experiments with this agent in over 100 cases of disturbance of the nervous system in doses of 650 to 975 milligrammes (10 to 15 grains). He has promptly relieved headaches occurring during convalescence from various nervous affections. The results were complete in from one to two hours. In headaches resulting from alcoholism, which were difficult to relieve, good results were also obtained and the effects of the drug would last almost 10 hours. He had excellent results in relieving the headache in 3 cases of cerebral tumor, but the initial dose required was 1.5 grammes (23.2 grains) three times daily. The dose was afterwards reduced to a total of 390 milligrammes (6 grains) each day. He observed no toxic symptoms in any of his cases (*Therap. Monatsh.*, Vol. XII, page 177).

Dr. C. Horneffer of Berlin, Germany, has made use of this agent in 45 cases of pulmonary tuberculosis as well as in pneumonia and typhoid fever and expresses himself as well satisfied, for he finds there are no ill-effects even though he may keep up the treatment for months. He observed little effect, however, in various forms of ischia, but his results were very gratifying in trigeminus neuralgia

and in headaches; in the latter cases he accomplished his results with one dose (*Therap. Wochensch.*, Vol. IV, page 1052).

Dr. Eduard Fenerstein of Vienna, Austria, claims to prevent fever completely in pulmonary tuberculosis by the use of 600 milligrammes ($9\frac{1}{2}$ grains) given in divided doses throughout an hour. He claims to have verified the observations of others as to its harmlessness, but cannot verify the results of others when they claim good results in rheumatism. His results were obtained from observing some 59 cases. 49 were of pulmonary tuberculosis in all stages of consolidation. (*Centralbl. für die gesammte Therapie*, Vol. XV, page 586).

Pyrogallol (Pyrogallic Acid) although not at all new has been more frequently commented upon during the past year than in the previous one. Dr. Veiel of Cannstadt, Germany, has published the results of his considerable experience with this Acid. He has used it in the treatment of tuberculous processes in many cases, and he finds it preferable to any surgical treatment. He claims that the only disadvantage he finds in its comparative use surgically, is the length of time required. He first destroys the diseased tissues with a 10 per cent. vaselin ointment by spreading it upon lint and applying it for from three to five days. Healing sets in almost immediately and the following applications are reduced in strength from $\frac{1}{2}$ to 2 per cent., under which the healing progresses to completion. He has found that this weak per cent. is sufficient to destroy all lupus tissue and does not retard granulation. (*Archiv. für Dermatologie und Syphilis*, Vol. XLIV, page 353).

Dr. L. Leistikow of Hamburg, Germany, recommends this agent in place of Chrysarobin in the treatment of ungual favus, and claims to obtain no secondary troubles as is the case with the latter agent. His plan of treatment is to apply the following spray upon the nail:

Pyrogallol.....	1 0 gramme (15.4 grains)
Ether.....	100.0 grammes (3 $\frac{1}{2}$ ounces)
Yellow Wax.....	0.2 gramme (3 $\frac{1}{2}$ grains)

Afterwards applying the following mixture:

Pyrogallol.....	1.5 grammes (23.2 grains)
Naphtol.....	2.0 “ (30.9 “)
Ammoniated Mercury...	1.0 “ (15.4 “)
Tinct. of Guaiac.....	30.0 “ (463 “)

An oxidized form of Pyrogallol has been known for some years, but the new name of "Pyraloxin" has recently been coined for it. Dr. P. J. Unna of Hamburg, Germany, has repeatedly recommended it in various skin affections.

The Bismuth Oxy-Iodide compound of Pyrogallol has been given the name of "Pyroform" and appears in the form of a fine powder used to dust on in affections of the skin.

The Mono-Acetate of Pyrogallol has been given the name of "Eugallol" and has been experimented with by Dr. Kromayer of Halle, Prussia, in the treatment of psoriasis and like affections with good results. It appears in the form of a nearly translucent brownish-yellow syrup, readily soluble in water and in acetone, and is usually offered diluted with 33 per cent. of the latter. The Tri-Acetate has been given the name of "Lenigallol." This comes in the form of a colorless powder, soluble in water, but decomposed by alkalis. It is claimed to be non-toxic. It has been used in the form of a 50 per cent. lanolin ointment with some success. The Di-Salicylate has been given the name of "Saligallol." This is offered in the form of a resin-like body which is dissolved in either two parts of Acetone or 15 parts of Chloroform, which forms a varnish-like liquid. It is presented for use in the form of a 66 per cent. solution in Acetone and is used like the syrup "Eugallol."

Resorcin (officinal) is still a prominent agent before the profession. Its use has been continued in the treatment of hay-fever. Dr. F. Müller stated before the Vienna Medical Club at its meeting on October 20th last, that he had several patients with chronic hay-fever accompanying gastro-intestinal troubles in which this agent was effective. He emphasized the fact that this affection is closely related to gastro-intestinal disturbances, and therefore he makes a part of his treatment the drinking of alkaline mineral waters and a course of massage. He also applies a Silver Nitrate Solution to the nasal cavities and irrigates liberally with water. Then he applies with a brush the following solution :

Resorein.	3 grammes (46.3 grains)
Menthol.....	3 " (46.3 ")
Alcohol.....	14 " (216.1 ")

This agent has been used effectually as a local anæsthetic in cases of stomatitis of the lips which has followed a rash. The plan of treatment is to wash the mouth out well with lime water, and then apply a 1 to 6 aqueous solution of Resorein with a brush. A

burning sensation is felt for a short period but the pain is found to be much reduced after this sensation has passed off. When the water has evaporated it leaves the Resorcin as a white powder on the lips, which is allowed to remain there. This treatment was persisted in from 5 to 6 times a day and usually the pain completely disappeared after the fourth application. The exudation ceases after two days when desquamation takes place. Resorcin was found in the urine in a few hours after its administration.

In relation to the "Untoward Results after Administering Resorcin" a correspondent writes to the Editors of the London *Lancet* as follows :

"Sirs,—Recently I was called in consultation with another medical man to see a child and we prescribed resorcin in 2 gr. doses. The mother states that a quarter of an hour after the powder had been administered the child's mouth became inflamed and the tongue was swollen. When I saw the child the following morning blisters had been formed on the lips similar to what would have been produced by boiling water, and in addition to a thick white coating on the tongue there was a distinct excoriation outside the mouth. On making inquiries we found the drug dispensed had been exposed to light and presented the appearance of decomposition having taken place and it occurs to us that carbolic acid or other irritant may have been produced. The chemist we have reason to believe has suggested to the parents that the injury was due to the drug having been administered without a vehicle. We have never known or heard of severe results of the kind being produced by pure resorcin and we think that in the present instance decomposition or the substitution of another drug may have had much to answer for. Perhaps I ought to have mentioned that the child was suffering from cholera infantum. I enclose some of the powders and we will feel obliged for your opinion.

I am, Sirs, yours faithfully,

Sept. 5th, 1898."

L. C.

(London *Lancet*, Vol. II for 1898, page 779) which is followed up two weeks later by another correspondent who writes the following :

"Sirs,—I am not at all astonished at the experience of your correspondent 'L. C.' Resorcin is an escharotic of considerable power, acting chiefly on epithelium and therefore on mucous membranes. I have on several occasions employed it for destroying the granulations of rodent ulcer and epithelioma in cases where operation was refused or contraindicated. Resorcin is very soluble in water, 1 in 1,

and it is not therefore surprising that, if placed in the unpowdered state, undiluted, on the delicate mucous membrane of an infant's mouth, it should produce caustic or vesicant effects. I should be very much astonished if it did not. The drug for internal administration should be diluted with some inert powder or given in some suitable vehicle. No doubt an adult might take it in the powdered state by swallowing it with a draught of some liquid without injury, but that is a very different thing from placing it on an infant's tongue, where it immediately forms a highly-concentrated and active solution. With regard to the discolouration of the specimen referred to this would either not affect its action at all or make it slightly less active. If your correspondent and his colleague had ordered 2 gr. of pure carbolic acid instead of resorcin, and the former had turned a pink colour as it does on exposure to the light, they might just as well attribute the caustic action that would follow to this discolouration as in the case referred to.

I am, Sirs, yours faithfully,

Sept. 20th, 1898."

PHARMACOLOGIST.

(*London Lancet*, Vol. II for 1898, page 836).

Experimenters have evidently been striving after a soluble form of Resorcin, and it is claimed that one has been produced with the following composition, Di-Resorcin-Hexa-Methylen-Tetramin and has been given the name of "Polyformin." It comes in the form of small, colorless crystals which are soluble in cold water and alcohol.

Roentgen Rays (X-Rays). For the want of a better name this department of scientific investigation has now been given the name of Radiography, and less prominence has been given it in the literature for the reason that the novelty of the subject has quite passed off. Although this may be the case, the scientific interest in the subject is not only not diminished, but is on the increase. Little that is new has been discovered concerning the X-Rays for some time past, but much improvement has been made in the various styles of apparatus and the more convenient application. One of the most prominent workers in this line has been Prof. John Trowbridge of Cambridge, Mass., who has been working with his assistant Mr. John E. Burbank in the Jefferson Physical Laboratory of Harvard University. A short account of his recent investigations has been published under the head of "The Source of the X-rays." His experiments "were conducted with Crookes tubes containing no interval between the anode and the

cathode ; and no discharge therefore in the usual sense occurred in the tubes. A continuous conductor was led through the rarified tube, and it was discovered that the X-rays were given off from every element of this conductor at right angles to its surface when a disruptive discharge occurred in the circuit of which the tube formed a part. This remarkable result was obtained by means of the very high electromotive force obtained by a Planté rheostatic machine which was charged by ten thousand storage cells.".....

"The most interesting results obtained with this form of tube was the production of the so-called X-ray burn by means of the brush discharge from its bulb. When the back of the hand was exposed to this brush discharge, which assumed a peculiar forked nature in the dark-room, a peculiar prickling sensation was experienced and all the symptoms of the well-known X-ray burn developed. The skin when examined under a microscope exhibited an appearance similar to that shown by the photographic plate. There were centers of inflammation surrounded by regions of lesser degrees of burn. It seems evident that the so-called X-ray burn is due to an electrification—a discharge at the surface of the skin—and this electrification may or may not be accompanied by the X-rays."....

"In order to test the question whether the so-called cathode rays and X-rays are generated primarily only at the cathode, a very large resistance of distilled water was interposed in the circuit with the continuous wire tube in order to damp any oscillations which might arise. The circuit thus consisted of the tube, the water resistance, a spark gap and the secondary coil of a large Ruhmkorff. The tube was connected at first permanently to the air pump. As the exhaustion proceeded a beam of rays proceeded from the mirror on the continuous conductor which was focused on the wall of the tube. This beam was more brilliant and produced a stronger fluorescence on the tube when the wire was negative than when it was positive. At a higher stage of the vacuum, however, very little if any difference could be detected in the appearance of the tube, and X-rays could be detected outside the tube opposite the fluorescent spot caused by the mirror. That is, the X-rays were given off both when the wire constituted the cathode of the circuit and also the anode. It seems therefore that the term cathode rays is not a general one. It would seem that electric rays might be a more comprehensive one for both cathode rays and X-rays.

Furthermore the phenomenon of electrostatic induction plays an important part in the phenomena of the so-called X-rays."

"The behavior of aluminum toward the X-rays is so remarkable that it merits especial investigation. Can it be that it manifests a remarkable condenser action toward the high electromotive forces which produce the X-rays, similar to the action which has been observed at lower voltages? We connected to the air pump, at the same time, two exactly similar tubes, one of which had two pointed terminals of platinum, the other two pointed terminals also; but one consisted of aluminum, and the other of platinum. The discharge from a Ruhmkorf coil was sent through these tubes which were in multiple circuit. At a certain stage of the exhaustion it was seen that the discharge passed more easily when the aluminum wire was made a cathode than when it constituted the anode. When the wire terminals in both tubes were made of thin discs, the difference was less marked. This might have been surmised, from previous investigations on the effect of form of electrodes on resulting polarization. It may be that the anomalous action of aluminum in respect to X-rays is due to a species of dielectric polarization on the surface of the platinum and that thus the surface becomes a new source of electrostatic stress, similar to that which was observed by connecting a bit of tin-foil and a capacity to the tube."

He finally draws the following conclusions:

"1. A Crookes tube enclosing a continuous conductor is well suited, with the employment of high electromotive force, for the study of electric lines of induction.

2. The direction of the so-called X-rays and cathode rays can be changed by electric induction.

3. The so-called X-ray burn can be produced by an intense state of electrification.

4. The so-called cathode rays and X-rays are given off from every element of a continuous conductor at a high stage of the vacuum in a Crookes tube, both when this conductor constitutes the cathode and when it forms the anode of the electrical circuit. The term electric rays, possibly rays of polarization, would appear to be more comprehensive than the terms cathode rays and X-rays." (*The Amer. Journ. of Science*, Vol. V (Fourth Series), page 129.)

Dr. W. S. Hedley of Mansfield Street, London, W., has written a short article under the title of "Radiostereoscopy" and introduces the subject as follows: 10

“The progress of radiography seems to open up a field of usefulness for the long neglected stereoscope. If it be realised that upon the radiographic film or the fluorescent screen there are thrown upon one flat surface, as in a transparency, the shadows of a variety of objects, which latter in reality occupy in space very different planes, and if further it be borne in mind that such light and shade as the radiograph presents are nothing more than indications of relative opacity to the x rays, it is evident that such a picture can only very imperfectly display the true relationship of objects and must entirely fail to give any adequate idea of the contours of their surfaces. In the case of foreign bodies an exact localisation can of course be secured ; that is to say, the radiographer is able to give the exact position of the foreign body with reference to certain artificial surface marks ; but such information cannot convey to the mind as sight does a clear conception of the various objects that go to make up the picture. Yet this is what is chiefly wanted. Any method therefore must be acceptable which will enable the surgeon to see with his own eyes at one glance, and at any time during an operation, the *tout ensemble* of the region he is dealing with. It appears to me that the stereoscope is able to accomplish this.

To obtain a stereoscopic effect it need scarcely be said that the first requirement is true binocular vision on the part of the observer. The second indispensable condition is that there be two corresponding pictures of an object, the one seen from the point of view of the right eye and the other from the point of view of the left eye. It is evident that in the case of the radiograph these can be secured either by moving the object itself or by laterally displacing in a direction parallel to the plane of the sensitive plate the source from which proceed the x rays. In dealing with the living body the latter is the simpler process. But the vital point to ascertain is, what ought to be the proper extent of this displacement and what are the physical and physiological considerations upon which the extent of this displacement must be made to depend? In other words, given a certain distance of the positive electrode from the object to be radiographed and the thickness of the object itself, what is the proper lateral displacement of the focus tube? or given a certain displacement of the tube and a certain thickness of the object, what is the proper distance of the anode from the object to be radiographed? I have experimented on a purely empirical basis with the ordinary lenticular stereoscope and have at times obtained effects which were fairly correct. More often the relief is exaggerated or otherwise untrue.”

Then follows some technical terms and forms which are probably only of interest to those who would desire to go into the subject more in detail. (London *Lancet*, Vol. I for 1893, page 639).

The botanists have been studying the action of the Rays on germination. It is found that the seeds of some plants germinate more rapidly when exposed for a few hours each day to the action of the Rays. They claim to have eliminated the electrical influence by using a sheet of aluminum which had been connected to the earth in the way of a screen between the lamp and the seeds. They found that the temperature as determined by a delicate galvanometer attached to thermo-electric needles did not rise perceptibly, even though the exposure lasted for two hours. Therefore they conclude that the influence on the germination must be entirely due to the Rays.

The action upon plant life in general also has been investigated and it appears to be settled, at least by some observers, that the action of these Rays is quite identical with that of light itself. When branches of the plant *Elodea canadensis* were immersed in water charged with carbon dioxide gas and exposed to the Rays, bubbles were evolved exactly as occurs by exposure to sunlight. Likewise the absorption of oxygen by the plant *Mycoderma aceti* was retarded by a similar exposure. The observation has been verified by more than one observer that the *Bacillus anthracis* is destroyed by exposure to these Rays exactly as to sunlight, but to a slightly less degree. It now seems to be quite necessary to prolong the exposure to produce the above results, for it is claimed that the failure to produce them previously was due to the short time of exposure.

Many professional observers are working undoubtedly with this interesting and valuable means of obtaining an insight into the animal body, and although as above stated little has been accomplished which can be called new in the general treatment of the subject, still in the special application to medicine and surgery, much has been written, therefore it would be quite impracticable to do more here than give some of the prominent illustrative applications of interest to the profession which have come forward during the past year. In the simple process of injecting into the cadaver, much improvement has been accomplished in regard to obtaining satisfactory pictures of the arterial system. Various salts have been used and the plan of injecting with plaster of paris or wax has been quite displaced by the use of other material. One of the most recent articles used is Mercury which gives a very excellent picture

when exposed to the Rays. It is now proposed to use such in illustrating the text-books to replace the usual rough sketches and drawings.

Of the value of the X-Rays as a means of diagnosis, there is now but little doubt, and even the Courts are beginning to realize that it is a trustworthy form of evidence. It has become quite the routine practice among surgeons now-a-days to make use of these Rays in cases of fracture and dislocation in which there exists any degree of doubt.

Dr. C. L. Leonard of Philadelphia, Pa., read a paper on the value of these Rays as a means of surgical diagnosis before the Atlantic County Medical Society at Atlantic City, N. J., on December 10th last (*Univ. Med. Magazine*, Vol. X, page 412). He opens his remarks as follows :

“ The advantages prophesied for surgical diagnosis from Röntgen’s discovery have in a great measure been realized. No greater proof of the value of this method can be found than the rapidity with which it has been adopted as a routine method by the most conscientious and skilful surgeons of to-day. The exact knowledge and the confirmation of diagnosis that it gives has made it an essential in surgical practice, and those desiring the best results for their patients demand in every case this additional means of acquiring a knowledge of the true condition.”

He relates his experience in this line and includes in his paper six very satisfactory pictures of fractures and injuries.

Dr. Carl Beck of New York City reports his observations with the use of these Rays in diagnosing arteriosclerosis which may be of interest to those who would desire to make a trial in that line (*N. Y. Medical Journal*, Vol. LXVII, page 109). He also read a paper before a meeting of the German Poliklinik on October 29th last in which he gave his observations with them in Colles’ Fracture. His paper is illustrated and he relates three cases, and concludes as follows :

“ Nothing may inculpate or exculpate a surgeon more than a good skiagram. In the May issue of the *International Medical Magazine* I published an illustration which showed an enormous amount of callous ; it prevented pronation as well as supination so much that the case was pronounced to be one of vicious union. It was only the skiagram that exonerated the attending surgeon.”

Mr. C. T. Dent, Surgeon to St. George’s Hospital, London, England, has written an article (*The Practitioner*, Vol. LX, page 123)

on the value of these Rays in surgical cases, which is well illustrated, and calls attention to the already inevitable reaction which is stated in regard to their use, particularly for the reason that their practical application is naturally much exaggerated when applied to medicine and surgery.

Dr. Ernest A. Codman of Boston, Mass., has carried on a series of experiments on the application of these Rays to the study of anatomy, and has published his results (*Journal of Experimental Medicine*, Vol. Third, page 383). Several excellent photographic plates accompany his paper. He alludes to the distortion of the pictures and particularly to the fact that the parts if kept at a distance from the plate have their shadows magnified. "Curiously enough this distortion can be very nearly corrected by the use of the stereoscope. Two skiagraphs may be taken of an object which, when placed in the stereoscope, will give one picture of that object which will have the appearance of solidity. To take stereoscope pictures two exposures are made with the plate and object in exactly the same relation to each other, but with the light in a slightly altered position in relation to both. This should be done by moving the tube to the right or left a distance corresponding to the normal space between the eyes or a little less after taking the first skiagraph in the usual position. At the same time a new plate is substituted for the old one, care being taken to put it in exactly the same place.

In the stereoscopic pictures the skiagraphs were reduced to small 'transparencies' and printed so as to make the bones and arteries appear white for greater effect."
 "in such skiagraphs as those of a hand we seem to look at either the palmar view or the dorsal, that is, the palmar arch will appear in front or behind the bone according as the one or the other of the prints occupies the right-hand space.

Now since the parts of the object farthest from the plate are enlarged, the best arrangement will be that which in the stereoscope will make us seem to look at the enlarged or near side of the object. The enlargement will then be that which would naturally exist on the retina in looking at the object from the side away from the plate. Thus the distortion is in part corrected. The criticism of these pictures, however, may justly be made that the parts of the object which show the clearest and with most detail are those which appear farthest off in the stereoscope. This of course is contrary to the simple optical effect. It is, however, not noticeable except in stereoscopic pictures of deep objects."

Dr. J. William White of Philadelphia, Pa., read a paper before the American Surgical Association a year ago on the surgical application of these Rays, which now appears in print in the *Amer. Journ. of the Medical Sciences* (Vol. CXV, page 1) in which he has formulated "tentatively and as concisely as possible the present state of our knowledge as to the surgical applications of skiagraphy, with the hope that my conclusions may be corrected or supplemented by the experience of other members." Some quite satisfactory plates accompany his paper. He closes by stating that he intends to continue his experiments which no doubt will be published later.

A portable X-Ray apparatus has been offered by Dr. Reginald A. Fessenden of Pennsylvania for surgical use in the field. Its weight is about 25 pounds and is operated by a little gas engine of about the same weight. This is claimed to accomplish all that is practically called for in an emergency in the field. A report of its actual use is awaited with interest.

In the British Army also a similar apparatus is being used both in India and elsewhere. Such an apparatus was made use of by the German Red Cross Society in the late war between Turkey and Greece. Dr. H. Küttner of Tübingen, Germany, surgeon in that Society has published an account of his diagnostic results obtained at the front of the Turkish lines. He claims that it helped him not only in localizing the seat of projectiles but also in the estimate and treatment of injuries to the nervous system. He was able to differentiate between a severe paralysis caused by a contusion of the spinal cord by a splinter or by a rifle bullet, and also whether it would be advisable to undertake an operation of the central nervous system with any degree of success. Not only has the surgeon been able to locate bullets in the cranial bones, but one case of sarcoma of the brain was localized by means of these Rays. A picture was taken after death and showed a tumor in the form of a comparatively dark but fairly well-defined area, and the localization was fully confirmed by the autopsy. This led to further experiments on dead subjects in the way of localizing various kinds of gross brain lesions. The observations are yet incomplete but promise is made of the publication of the results obtained. The hope is expressed, however, that cerebral tumors may be localized when of sufficient size not to conflict with other interior parts. Previous observations in this line have not thrown out much hope of the possibility of favorable results, and some observers have written their opinions adverse to much prospect of success, but further investigations will be awaited with interest.

Dr. Robert Müllerheim of Berlin, Germany, has carried on a series of investigations in relation to the use of these Rays in obstetrics, not only during the stage of pregnancy but under other conditions. He claims that the various forms and degrees of pelvic deformity, such as rachitis, osteomalacia and spondylolisthesis may easily be detected and the proper treatment begun early to remedy the defects as far as possible in case of a pregnancy that may follow. The distance also between the posterior superior iliac spines, the breadth of the sacrum and other pelvic measurements can be accurately determined by the skiagraphs obtained. The presentation of the fetus may also be determined as well as the size of the approaching head, and the dimensions of the pelvis. He illustrates his article to good effect. (*Deut. Medicin. Wochensch.*, Vol. XXIV, page 619).

Drs. I. Boas and M. Levy-Dorn of Berlin, Germany, have studied these Rays in a diagnostic way in the gastro-intestinal tract for the purpose of detecting not only new growths but to discover changes in the position of the stomach. They also have made observations of much value on cases of narrowing of the pylorus and intestinal stenosis. To this end they would administer gelatin capsules containing a substance like Bismuth which was impervious to the Roentgen Rays. These capsules would be coated with celluloid to prevent their being digested. Their position then throughout the alimentary tract could be determined by the use of the fluoroscope. In order to detect the capsules when they had been excreted they were stained with an inert aniline dye. His observations covered fourteen cases. Peristaltic action was followed quite closely, as well as the excursion of the stomach during inspiration and expiration. Of course the location of the capsule could only be determined relatively in relation to the abdomen, and could not be referred necessarily to any particular section of the intestine. They apparently watched with much interest to note the passage of the capsule through the pylorus into the intestine, but unfortunately did not succeed. In cases of growth around the pyloric end of the stomach they have observed the capsule remain in the fundus of the stomach for quite four or five days. This was quite a diagnostic point, showing evidences of trouble at that locality. Where no stenosis of the tract was present they would find the capsule evacuated in from two to six days. (*Deut. Medicin. Wochensch.*, Vol. XXIV, page 18).

Drs. Arnozan and J. Bergonié of Bordeaux, France, have reported

what they claim to be a new use of these Rays, in the determination of the direction and form of fistulous tracts. Their observation was made upon a young girl with a pleural fistula caused by an empyema previously operated upon. The fluoroscope detected the form and direction of the tract. A hollow sound through which a thin thread of metallic lead was passed, was introduced into the fistula in order that the picture in the fluoroscope might be evident. Antiseptic precautions were taken. (*Journ. de Méd. de Bordeaux*, Vol. 27, page 547).

Dr. Francis Pott of Bournemouth, England, read a paper before his local Medical Society on November 10th last "Concerning the Action of X Rays on Cultivations of Tubercle Bacillus" in which he states that his detailed experiments were undertaken with a view of ascertaining whether x rays inhibit the growth of or kill the tubercle bacillus, and closes by stating that

"These experiments point to the conclusion that x rays do not affect the tubercle bacillus, and lead us to believe that the improved condition of tuberculous patients who have been submitted to the influence of x rays was due to causes other than the action of the rays." (London *Lancet*, Vol. II for 1897, page 1314).

Dr. Hermann Rieder of Munich, Bavaria, has worked along in the same line and contributes the results of his experiments in a paper entitled "A Further Contribution Concerning the Effects of Roentgen Rays on Bacteria, as well as upon the Human Skin." He alludes to the negative results obtained by previous investigators, and then proceeds to describe the apparatus he uses, with the result that his experiments rather indicate that the growth of the tubercle bacillus could be influenced by the Rays, and feels encouraged to push further in his investigations not only upon animals but upon the human subject. (*Münch. Medicin. Wochensch.*, Vol. XLV, page 773).

Mr. Mackenzie Davidson has described in detail an apparatus for exact measurement and localization by means of these Rays in the *British Medical Journal* for January 1st, 1898 (Vol. I for 1898, page 10), and again brought it forward at a meeting of the Ophthalmological Society of the United Kingdom on January 27th last, when the subject of the localization of foreign bodies in the eye and orbit was under discussion. This may be of interest to those who care to follow up the subject. (*Brit. Med. Journ.*, Vol. I for 1898, page 372.)

Dr. A. G. Thomson of Philadelphia, Pa., read a paper at the

Fourth Annual Meeting of the American Academy of Railway Surgeons held in Chicago on "The Effect of X-Rays in Ophthalmology" in which he makes the following statement :

"Ophthalmology is undoubtedly indebted to the X-ray, as it has added another accurate method in diagnosis of the injuries complicated by presence of foreign bodies.

As regards the deleterious effects of the X-ray, they are small in comparison to the great benefits derived. I have seen several instances of the hair falling out and slight dermatitis, but this is always due to the fact of the vacuum running down and the rays not penetrating, and to long exposures. I have never seen any serious damage to the eye."

Then follows a demonstration of the method adopted. The discussion which followed the reading of the paper will be interesting to those who are working in that line. (*Journ. Amer. Med. Assn.*, Vol. XXX, page 1087).

Dr. Francis H. Williams of Boston, Mass., has taken up the medical side of the use of these Rays and read a paper before the N. Y. State Medical Society on January 25th last, in which he concludes as follows :

"In making a diagnosis, physicians will find that although much that the X-ray reveals can be recognized by other means, it would often be an advantage to have this information confirmed by another method, and we must also appreciate that it can extend our knowledge into a field which was previously beyond our reach. A diagnosis may be made by an X-ray examination alone in certain cases, as in aneurism, emphysema, and pneumothorax, and in a few cases by it alone, but as a rule it is only one method and should be used in connection with others. The fluoroscope and stethoscope, for instance, supplement each other. X-ray examinations, in suitable cases, give earlier evidence of disease than the older methods. I daily find them indispensable in making a complete examination of patients who may have a disease of the chest, and can by them determine in some cases the presence of an abnormal condition, or more fortunately its absence, or sometimes completely change the diagnosis which had been previously made.

The X-ray is still too recent a discovery to have reached the limit of its usefulness, and its application in medicine deserves and will repay careful study." (*Medical News*, Vol. LXXII, page 609).

Dr. L. Derville of Lille, France, has written a paper on the "Accidents Caused by the Roentgen-rays." (*Journ. de Soc. Méd. de Lille*, Vol. 21, page 300).

The *Philadelphia Medical Journal* (Vol. 1, page 705) makes the following pertinent remarks on the errors possible in the use of these Rays in diagnosis :

“ Even those surgeons who are familiar with the appearances of fractures and other lesions through the fluoroscope, or as seen in skiagraphs, are liable to be deceived. Skiagraphy must be used as microscopy is used, in connection with clinical observation and experience. In other words, it is necessary to know anatomy and surgery in order to fully appreciate the findings disclosed by the use of the Röntgen-rays. This is only a repetition of what experience has taught the profession in the mutual service which clinical medicine and pathologic histology render each other. The pathologist who knows nothing of the clinical side of medical science is probably as dangerous to the patient as the practising physician who knows nothing of pathologic histology. A diagnosis founded on the microscope alone is just as likely to be erroneous as one founded on clinical examination without the aid of the microscope.

Attention is called to the danger of relying too absolutely upon the appearances in skiagraphs because of a recent article in a medical journal published in an important medical center of the United States. A professor of surgery in one of the medical schools of that city makes the unexpected statement that in 44 cases of fracture of the lower end of the radius which were skiagraphed, 19 showed that ‘a distinct transverse fissure above the capitulum ulnæ existed, without causing any apparent symptoms.’ He then proves his assertion by printing several skiagraphic pictures of the lower end of the forearm which show a white line running more or less transversely across the lower end of the ulna. In one case the patient was shown, he says, 5 days after the injury to an audience of about 100 physicians. No one of these was able to recognize the ulnar fracture by examination of the patient, in whom there was, according to the author, no visible deformity at the seat of the ulnar fracture. It is curious that neither the professor himself nor his 100 colleagues recognized the supposed line of fracture as the unossified epiphyseal cartilage normally present in children and young adults. This criticism is made because the unfortunate error of the author may lead to erroneous deductions and conclusions on the part of those who read his article.”

In this same line Dr. Edward A. Tracy of Boston, Mass., writes on “The Fallacies of X-Ray Pictures” in which he concludes :

“ Because X-ray pictures can be fallacious, should they be ex-

cluded from court as evidence? Certainly not. It is well to know their limitations, and to remember that appearances may deceive. X-rays, properly used, are as a search-light in the exposition of bone lesions. But the lesions must be pictured from different directions, and the resultant pictures compared with pictures of the normal opposite member. Moreover the pictures of the injured member and those of the opposite normal member, must be taken with the same relative positions of the Crook's tube, the limb and the sensitized plate. Then can truth be arrived at, and truth is essential for justice." (*Journ. Amer. Med. Asso.*, Vol. XXIX, page 949).

Saligenin (produced synthetically from Phenol and Formaldehyde) was not spoken of here last year, for the reason that so little was said about it in the current literature. Not much more has been said during the past year, but one prominent article may be mentioned, that of Dr. Walter of Sulzbach, Bavaria, entitled "Saligenin and Aminoform, two Antiuratic Remedies." He reports favorable results in the treatment of gouty conditions, especially in acute attacks. He has not succeeded so well in the chronic type. (*Muench. Medicin. Wochensch.*, Vol. XLV, page 302).

Salipyrin (reported to be a true Salicylate of Antipyrin) is still in use although little spoken of directly. It has recently appeared in the form of several new compounds with metals. Thus an Iron Salicylate-Antipyrin has been called "Ferri-Salipyrin" which appears as a yellowish-brown powder, and when mixed with water separates in irregular crystals with a greenish fluorescence. The combination Nickel Salicylate-Antipyrin goes by the name of "Nickel-Salipyrin." This is a pale green powder which when dissolved in alcohol crystallizes out in almost colorless, needle-like crystals which are reported to turn dark green after losing their water of crystallization. The combination Cobalt Salicylate-Antipyrin goes by the name of "Cobalt-Salipyrin," and appears as a pale red powder which crystallizes out from water in dark red crystals which finally turn a fine blue color. The above are only interesting items at this time as no definite clinical reports have yet appeared.

Salitannol is the name given to a new antiseptic condensation product resulting from the action of Phosphorus Oxychloride upon a mixture of Salicylic Acid and Gallic Acid in molecular quantities. The combination is reported to have distinct properties of its own. It appears in the form of a colorless, amorphous powder, insoluble in water, ether, chloroform and benzene. It is also only

slightly soluble in alcohol. It melts and is decomposed at a temperature of 210° C. (410° F.). It has had a limited but reported successful use as an external antiseptic in the treatment of all kinds of wounds, and is said to combine the properties of Salicylic Acid, Gallic Acid and Tannic Acid.

Salol (Phenyl Salicylate)—officinal (U. S. P.)—is still a very prominent agent in the hands of the profession and the recent revision of the British Pharmacopœia has now recognized it as an officinal article. Its use is undoubtedly largely on the increase and only a few references can be given here out of the large number of reports. It may be worth quoting here completely the report of Dr. Herbert Bramwell of Cheltenham, England, on its use in typhoid fever as follows :

“ At the present time, when an epidemic of typhoid fever is causing so much distress, any method of treatment which has proved of undoubted value may be worthy of a short notice in your columns.

During the last ten years the use of salol in typhoid fever has afforded me the most gratifying results. When steadily given in frequent small doses, either alone or combined with diaphoretics or astringents, or other drugs, as indicated, until the urine has become slightly tinged, marked benefit has invariably been obtained. Cases which appeared of a severe type and promised to result in a long and dangerous illness have been so modified by its use as to pass through mild and uncomplicated courses of three to four weeks' duration.

In several mild cases of undoubted typhoid, as proved by the typical rash, the progress of the attack has been completely aborted and convalescence established in the course of two to three weeks.

The drug should be used in the powdered form, and not compressed, as in the latter case it frequently passes through the intestinal tract completely unchanged. It should be given in 5 to 10 gr. doses (according to age) every four hours until the urine is tinged, when the amount and frequency of the dose must be diminished, giving only sufficient to maintain the faint coloration of the urine. Used in this manner it has, in my experience, invariably checked the increasing fever, and brought about a slow but steady defervescence, and improvement in all the other symptoms.

During the first few days of treatment cold packs and sponging is usually required in severe cases, but only until the drug has had time to affect the development of the poison.” (*Brit. Med. Journ.*, Vol. II for 1897, page 1214).

Another report of interest comes from Mr. Arthur H. Buck of Brighton, England, on the use of Boric Acid and Salol in cystitis, as follows :

“ The following case is probably of sufficient interest for publication on account both of the age of the patient and of the marked good effect of small doses of boric acid and salol on bacterial urine.

In the beginning of last December I performed supra-pubic lithotomy on a man eighty-three years of age. This operation was selected in preference to lithotrity on account of (1) the size of the stone, (2) its hardness, and (3) the presence of a large prostate. The bladder was drained after the operation by a large tube for three days, by a No. 12 catheter through the wound for three days, and by a catheter through the urethra for fourteen days. There was practically no escape of urine except through these tubes. Cystitis was present before the operation and in spite of washing out three and four times a day there were bacteria in freshly-drawn urine three weeks after the operation. The urine was of a dull light yellow colour and was becoming more alkaline, varying in quantity from three to five pints. On the twenty-second day 10 gr. of boric acid, and 3 gr. of salol were prescribed every four hours. Within two days the urine was acid, and in a fortnight it had regained its normal characters, no albumin being present and no bacteria. The patient was up in a fortnight and out of doors within six weeks after the operation. He still continues well in every way, passing a catheter nightly to get rid of residual urine. The calculus measured $1\frac{1}{2}$ in. by $1\frac{1}{4}$ in.; it was composed of oxalate of lime and weighed 1 oz.” (London *Lancet*, Vol. I for 1898, page 1322).

Finally, Dr. Oskar Werler of Berlin, Germany, having discovered that Salol is soluble in oil of Salosantal proposes its use in urinary affections. The solubility is found to be 33 per cent., and his dose varies from 10 to 20 drops after each meal given in a tablespoonful of water slightly sweetened. His results are based on ten cases, showing the advantages to be as follows : It is an analgesic as well as antiseptic ; it appears to be equally efficient in alkaline and acid urine ; it appears to act as a diuretic, and finally it is inexpensive. His best results were obtained in those affections of the urethra and bladder in which injections were impossible on account of the extreme sensitiveness of the parts. Good results were obtained in acute exacerbations and complications where painful inflammatory reactions occurred ; again in cases of chronic catarrh of the bladder

with either alkaline or acid urine present, and finally in cases of obstinate and chronic gonorrhea. (*Therap. Monatsh.*, Vol. XII, page 266).

Salophen (Acetyl-Para-Amido-Salol) is still much used, but little has been reported upon it directly during the past year. Rheumatic affections still take a prominent place in the list of its applications. Dr. N. Klimenko of Russia has obtained excellent results in cases where Sodium Salicylate had failed him both in acute and chronic rheumatism. He has obtained in some cases analgesic effects. His dose varied from 3 to 6 grammes (46.3 to 92.6 grains) daily (*Presse Médicale*, Vol. 5, second half, page 348).

It is reported (*Gazette hebdom. de Médecine et de Chirurg.*, Vol. III, new series, page 418) that this agent acts promptly not only in ordinary headaches but in migraine, facial neuralgia, toothache and influenza. The initial dose recommended is 1 gramme (15.4 grains) dissolved in water which may be repeated in an hour. However in cases of influenza it is recommended to divide the dose, giving 450 to 500 milligrammes (7 to 7.7 grains) every two or three hours, so that the dose may be diminished gradually as the relief is evident. In cases of an epidemic of influenza if taken early and in small doses, it appears to act as a prophylactic.

Dr. Richard Drews of Hamburg, Germany, appears to have made quite extensive use of this agent and reports on its therapeutic results. (*Therap. Monatsh.*, Vol. XII, page 146). His conclusions are that it is quite harmless in such daily doses as 3 to 6 grammes (46.3 to 92.6 grains); being quite odorless and tasteless it can be given either in the usual forms or simply in the original powder; its action is such that it splits up into its component parts slowly in the intestine, having passed through the stomach without change. It therefore has no toxic effects; it exhibits none of the unpleasant sequela of either Salicylic Acid or Sodium Salicylate in acute, sub-acute and muscular rheumatism and acts equally as well as these agents; in chronic articular rheumatism, however, he finds it has no advantage over Salicylic Acid or Sodium Salicylate; it acts well in cephalalgia, migraine and various forms of neuralgia; he has obtained the good results noticed by others in influenza, but particularly the nervous form; in chorea he has had good results; in skin affections in which itching is present, such as prurigo, urticaria, psoriasis and that present in diabetes and eczema it has given him good results.

Salubrol (Di-Methylene-Antipyrin Bromide), the new general

antiseptic of last year offered as a substitute for Iodoform, has not been heard of in the current medical literature of the year, and therefore has probably taken a very subordinate place in the list of general antiseptics.

Sanatogen is the name given to an albuminous preparation consisting of Sodium and Casein Glycerino-Phosphate prepared from Milk Casein. It varies slightly in its composition, but on an average it contains 13.02 per cent. of Nitrogen. It is readily soluble, and has a pleasanter taste and odor than other milk casein preparations. Mr. G. N. Vis, Ph.D., and G. Treupel, M.D., of Freiburg, Germany, have investigated its digestibility in healthy men over a period of a week at a time. They have carefully managed to have the same amount of work done on each day as far as possible, and have calculated that about half the total amount of nitrogen supplied in the food should come from Sanatogen. It was given in 5 gramme (teaspoonful) doses with each meal, after having been rubbed up in cold water and added to warm soup. No other clinical reports are yet on record except those of Dr. Hermann Schlesinger of Frankfort-on-the-Main, Prussia, who has used it in a number of cases with good effect. He has published his results under the head of "The Employment of Sanatogen in States of Disease" (*Muench. Medicin. Wochensch.*, Vol. XLV, page 716).

Sanoform (Di-Iodo-Methyl Salicylate)—the Iodoform substitute containing 62.7 per cent. of Iodine—has not been commented upon in the medical literature of the year.

Sanose is the name given to another new albuminous preparation containing 80 per cent. of Casein and 20 per cent. Albumose. It is offered as a colorless, tasteless and odorless powder which resembles milk in appearance when mixed with water. Drs. Schreiber and Waldvogel of Göttingen, Prussia, working in Prof. Ebstein's Clinic speak favorably of its action. (*Deut. Med. Wochensch., Therap. Beilage*, Vol. XXIII, page 65). They have made use of it in the form of a palatable bread which is rendered more albuminous by adding 10 per cent. of this agent. This form of bread is well suited to those who dislike meat, or for whom the amount of meat must be limited. These observers claim that it has no tendency to produce diarrhea which other like agents have. In their report they give an interesting series of tables showing its metabolism in fourteen cases.

No other very definite reports have yet occurred as to its use or action.

Somatose—the tonic and nutrient—has been given somewhat more attention in the current medical literature of the past year, and for the convenience of those who desire to make a more extended use of it a fairly complete summary of the references will be given here. Dr. Richard Drews of Hamburg, Germany, has continued his previous investigations with this article and now publishes his notes on 75 additional cases of his own, which added to the 25 previous ones make 100 in all. Added to these he has been favored by reports of 45 other cases observed by his physician friends. His present 75 cases quite confirm his previous views, and his observations have been confined pretty closely to its action on the mammary gland. It naturally has no action where the mammary gland is deficient or incapable of secreting. In cases, however, of insufficient secretion its administration has produced an abundant secretion of milk in a few days, after galactagogues had failed. In nearly all the cases showing a deficiency in secretion, the patients complained of headache and pains in the back and breasts, together with loss of appetite. After the administration of Somatose restoring the secretion, these symptoms all disappeared. His other observations will be interesting to those who care to look further into the subject. Dr. Drews explains its effects as those of a direct stimulation of the gland tissue itself and not by an improvement in the general condition (*Centralblatt für Innere Medizin*, Vol. 19, page 65).

Dr. Georg Joachim of Berlin, Germany, offers "A Contribution to the Question of the Action of Somatose on the Mammary Glands of Nursing Women" (*Centralblatt für Innere Medizin*, Vol. 19, page 233), giving his observations on fifteen cases in which there was a deficiency of secretion, and is satisfied that it produced not only an increased quantity of milk, but also a better quality. He disagrees with Dr. Drews in the claim that it has a specific action on the gland tissue itself, for he believes that it acts only by increasing the appetite and improving the general condition of the patient. He takes pains to give the details of three cases bearing out his views.

At a meeting of the Paris Medical Society of the Hospitals on June 17th last, a case was reported (which apparently was quite unusual) of glycosuria produced by the use of Somatose. During the discussion it was claimed by others, who stated they had never observed such a result which could be directly attributed to Somatose, that glycosuria was not uncommon during lactation and therefore it should not stand against this article of diet.

Dr. Adolf Schmidt of Bonn, Prussia, working in Prof. Schnltz' Clinic reports that he has observed that Somatose causes diarrhea although he notices that it is one of the best artificial foods. He has observed that a Somatose prepared from milk casein has decided advantages over that prepared from meat casein for it is freer from salts, but is apt to cause diarrhea oftener when given in large doses, than the meat Somatose. He therefore has made a practice of adding 5 per cent. of Tannin to the milk Somatose, which he claims forms a chemical combination well suited to weak digestive organs. He gives the name of "Tannin Somatose" to this preparation. He states it is soluble in water and can be given in quite large doses without bad effects. His dose varies from 5 to 10 grammes (1 to 2 teaspoonfuls) dissolved in hot water and made into a broth with a meat extract, which is well suited to chronic affections of the alimentary tract. His experience in fifteen cases of typhoid fever was very gratifying,—in only two of the cases was it vomited after administration. Based on his complete observations he finds it simply slightly astringent but not irritating, and is worthy of a more extended use. (*Müench. Medicin. Wochensch.*, Vol. XLIV, page 1318).

Dr. Rudolf Neumann of Würzburg, Bavaria, has published his "Observations on Metabolism with Somatose and Nutrose" (*Muench. Medicin. Wochensch.*, Vol. XLV, page 72). He carried on a careful investigation as to the amount of nitrogen injected and excreted, in which a mixed diet was given for four days and then followed with a five days' diet including Somatose. For three days of the five he used meat Somatose and the other two days milk Somatose. He finally concludes, however, that too general conclusions cannot be drawn from his results for there are so many conflicting elements entering into such an investigation. The food stuffs used in conjunction must surely bear quite an important part in the general improvement, and therefore he claims it will always be difficult to fix the exact amount of benefit due to any artificial food product.

There has recently been offered an Iron Somatose which is evidently indicated in cases of anemia and chlorosis. It appears in the form of a tasteless powder of much the color of cocoa, dissolving readily in water, giving a dark-brown solution. Encouraging results are reported in a very general way, in that it simply appears to have advantages over the ordinary inorganic iron compounds. It

is an astringent and appears to have a laxative effect upon the bowels rather than a constipating one.

Dr. Theodor Panzer working in Dr. E. Neusser's Clinic in Vienna, Austria, has made use of this Iron Somatose and records his results in a paper entitled "The Effect of Iron-Somatose" (*Wien. klin. Wochensch.*, Vol. XI, page 611) on 11 cases of anemia, 8 being chlorotic, 1 of purpura hemorrhagica, 1 secondary to gastric ulcer and 1 of unknown cause. He administered this Iron Somatose for an extended period and obtained very favorable results in one case of secondary anæmia and in three cases of chlorosis. The other cases varied somewhat in their action, but produced favorable results after a more prolonged use of the article. He found one of the greatest advantages of this form of food product, was that it was almost invariably well taken and produced nausea and vomiting only in one case. He states the great drawback to its more extended use, is its excessively high price.

Sozo-Iodol (Di-Iodo-Para-Phenyl-Sulphonic Acid)—the Iodoform substitute—has not been commented upon during the past year, except in the way of repetition of previous results.

Sulphonal (Di-Ethyl-Sulphon-Di-Methyl-Methane) has lost nothing of its importance during the past year and is one of the best known agents in the physician's hands. However, the poisoning cases continue, and at times are still due to the bad habit of the patients dosing themselves whenever they are affected with sleeplessness.

Mr. J. F. Gillett of Andover, England, reports a case of poisoning which may be interesting to those who are keeping a record of such effects :

"At 10 P.M. on July 9th I was called to see E. C., an anæmic and somewhat neurotic girl, aged 17. She had lately been suffering from neuralgia, and on the day mentioned she had altogether 60 grains of sulphonal—20 grains at 11 A.M., 20 at 2 P.M., and 20 at 3 P.M. Soon after 3 P.M. she began to be drowsy, and went to bed and slept for about two hours, when she woke up with a feeling of nausea, but was not sick. On getting up she was markedly ataxic, and 'walked as though very drunk.' Her condition rapidly became worse, and at 10 P.M. I was called in. I found the patient lying on the bed with closed eyes, and noticed marked muscular twitchings. The respirations were 48 and shallow, but every few minutes she took several deep breaths. The temperature was 95.4°, and the extremities were cold, with marked signs of cardiac weakness. The

pulse was very feeble and hard to count, but I registered it at 58. The pupils were slightly dilated, reacted slowly to light, and the corneal reflex was absent. The patient had hallucinations, thinking she was pursued by beetles and fleas; but when spoken to or roused, she became wildly delirious, striking and fighting with her attendants until completely exhausted. Not knowing the nature of the drug taken, I could only treat the most pressing symptom, and strychnine and brandy were repeatedly administered hypodermically. The patient's condition somewhat improved at 5 A.M.; during the day she slept and took nourishment well, but the bowels were not relieved, and she passed no urine. Towards evening she again became delirious, but her pulse was good. Croton oil was given, and also hyoseine hypodermically. This quieted the patient, and the oil operated freely. After some hours (thirty-six since commencement of the attack), 5 ounces of urine were passed; this contained no albumen. After this the patient made a slow but uninterrupted recovery." (*Brit. Med. Journ.*, Vol. II for 1898, page 808).

Dr. Otto Wien of Lübeck, Germany, relates a fatal case of subacute poisoning in a woman 32 years of age who was suffering from paranoia. (*Berlin. klin. Wochensch.*, Vol. XXXV, page 863). After relating the symptoms he closes by drawing the conclusion that the great danger in Sulphonal poisoning seems to lie in the irreparable changes found in the heart. He states that nine-tenths of the fatal cases have occurred in women, and although the total number of cases is small considering the amount of this agent used, yet he urges that precautions must always be taken. He advises that its use should be as limited as possible, and the customary intermissions of from four to five days are often too short. He lays great stress upon the fact that efforts should be exerted to promote rapid excretion of the Sulphonal through the kidneys.

Dr. Paul Pollitz of Brieg, Prussia, relates (*Vierteljahrssch. für gericht. Medicin.*, Vol. XV, page 297) a case of the peculiar susceptibility of women to the toxic action of Sulphonal, which may be of interest to those who are keeping a record of these cases.

Tannalbin (a compound of Tannin and Albumin) is still before the profession and reports continue to be made of its practical usefulness.

Dr. Hans Osk. Wyss of Zurich, Switzerland, reports his results from 75 cases of intestinal affections in children. He claims he cured 53, and 10 were improved in health. He obtained uniformly

prompt action in all his cases of enteritis and acute gastro-enteritis. Subacute cases ran along for a few days before complete recovery, and he had gratifying results in a few cases in which all the other remedies tried had failed him. His dose was 250 milligrammes (3.8 grains) from two to six times a day for children at the breast and up to two years of age. 500 milligrammes (7.7 grains) from two years up to five years, three to five times daily. He found it advantageous at times to inject into the rectum a dose of 500 milligrammes (7.7 grains) incorporated with starch, and favorable results were obtained especially when he continued to administer by the mouth. (*Correspondenz-Blatt für Schweizer Aerzte*, Vol. XXVII, page 449).

Dr. Johann Czernetschka of Prague, Bohemia, reports that he finds especially good results in the use of this agent in infants at the breast and in rachitic children. This report together with that of Dr. Wyss and Dr. L. Roemheld of Heidelberg, Germany, is summarized in the *Deutsche Medizinal-Zeitung* (Vol. for 1897, page 1041). Others have reported in the same favorable line as the above.

Dr. William Henry Porter has written on this agent under the title "Tannalbin: Its Physiological and Therapeutic Action," which article will be of interest to those who care to follow up the subject. (*The Post-Graduate*, Vol. XII, page 647).

From Germany comes a suggestion for the manufacture of an article quite equal to Tannalbin which can be produced at a much less cost. The directions to accomplish this are about as follows:

A mixture is made of

Albumin Solution, 10 per cent	.....	10	parts
Tannin	"	10 per cent	..... 6.5 "

from which a precipitate is collected. After washing well, pressing out and drying at 30° C. (86°F.) it may be powdered, sifted through a fine sieve and spread out thinly to be heated for about six hours at 120° C. (248°F.). This product is claimed to do all that the previously new product has done.

Tannigen (Acetyl Tannin)—the odorless and tasteless form of Tannin, insoluble in water and acids, but readily soluble in alkaline solutions—has not been commented upon specially in the current literature of the past year, although undoubtedly it is still much in use and is claimed by some to have equal if not greater advantages over the other Tannin compounds.

Tannoform (the condensation product of Tannin and Formaldehyde) has not been heard of in the literature much more than in the previous year, but two special articles have appeared which may be of value for those to read who desire to follow up the subject. Dr. Hesse of Darmstadt, Germany, reports his experience of its therapeutic action as a local application for decubitus, diabetic gangrene and different forms of moist eczema. In gonorrhea also he reports very definite favorable results. On open wounds after operations he has found it to be a valuable antiseptic, showing no toxic properties and little if any irritation. In cases of hyperidrosis not only of the body but of the feet it outranks any other remedy known to Dr. Hesse. He used it in the form of a mixed powder consisting of :

Tannoform	1 part
Taleum	2 parts

This undiluted powder is dusted on, however, only in very severe cases. A 10 per cent. ointment gave the best results in decubitus and the various forms of moist eczema. (*Arztliche Rundschau*, Vol. VIII, page 394).

Dr. Carl Sziklai of Kis-Zombor, Austria-Hungary, reports his decided success in the treatment of 40 cases of intestinal catarrh in children. His maximum dose for a child was 32 milligrammes ($\frac{1}{2}$ grain), and in his experience two or three such doses only will be necessary to perceptibly check any diarrhea. He rarely had to give as many as 10 doses. In adults he had equally favorable results. A preliminary dose of castor oil was found not only effective but quite necessary in cases of dysentery. (*Therap. Wochensch.*, Vol. IV, page 1050).

Tannone is the name given to a condensation product of Tannin and Urotropin, recommended as of value in intestinal affections. By analysis it is found to contain 87 per cent. of Tannin and 13 per cent. of Urotropin. It appears as a light-brown, tasteless powder almost insoluble in water, weak acids, alcohol and ether, but will dissolve slowly in weak alkalies. It splits up in the system and Urotropin is found in the urine. 200 to 500 milligrammes (from 3 to 7.7 grains) is recommended as a dose for children, given several times per day. For adults the dose is 1 gramme (15.4 grains). The name for this agent has been superseded by the new name

Tannopin. Under this head Dr. Carl Fuchs of Vienna, Austria, reports 7 cases as seen in the Clinic of Prof. Drasehe. He

claims its superior value in the treatment of affections of the urinary organs exactly as Nicolaier originally claimed. He confirms the observations of Dr. E. Schreiber who working in Prof. Ebstein's Clinie had the opportunity of testing it in 32 intestinal cases which included those of acute and chronic catarrh, tuberculous enteritis and typhoid fever. He alludes to his sixth patient as not giving as satisfactory results as the others, for the reason that the diarrhea occurred in the course of Bright's disease, when this agent did not act as satisfactorily. After administration of the Tannopin for weeks the diarrhea did not disappear entirely although the number of stools was reduced from five to two each day. In his seventh case which was one of cystitis, this agent reduced the smarting felt during micturition. The flow of urine increased and became clearer with less pus in it. Although the amount passed each time was increased he was disappointed in finding that the frequency of micturition was not diminished, thus proving to him that this agent was inferior in its action to Urotropin itself. This confirmed Dr. Schreiber's observation on this point. (*Die Heilkunde*, Vol. II, page 677).

Tanosal, the new synthetic combination of Tannic Acid and Creosote in the proportion of 2 to 3, has not been commented upon specially throughout the past year.

Terebene (produced by the action of strong sulphuric acid on Oil of Turpentine) is still used in various parts of the world. It was given up for a time by some users in certain localities, but these have finally come back to it after hearing favorable reports from other quarters. It has only just been recognized by the new revision of the British Pharmacopœia although it has been much used throughout the British Islands. It has been alluded to, however, as an illustration of tardy recognition, that now the British Pharmacopœia recognizes it when it has practically gone out of use in some parts of Scotland.

"A Russian doctor has employed a glycerol of terebene, prepared as described below, with much success as an antiseptic dressing. Doubtless the efficacy of the preparation is due to the hydrogen peroxide which it contains. Into a stoppered separator of a capacity of 5 or 6 litres, a mixture of glycerin, 7, water, 1, and terebene, 4, is added and left for a fortnight, with frequent agitation, at ordinary temperatures. The mouth of the bottle is fitted with a cork carrying two tubes, one of which passes to the bottom of the liquid; with this arrangement air is occasionally drawn through the fluid. Gradually the lower stratum, which originally consisted of glycerin and

water, changes to an opaque, viscous mass, having the aromatic odour of terebene. This is the glycerol used. Compresses of tarlatan impregnated with this substance are placed directly on the parts, which are then covered with absorbent cotton. It is an energetic disinfectant, and promotes the rapid healing of wounds." (*Pharm. Journ.*, Vol. VI, page 237).

Theobromin (the chief base found in the seeds of *Theobroma Cacao*) is still thought considerably of by some practitioners, particularly as a diuretic, although many other agents have been pushed with much more energy and thereby have taken the place somewhat of this older one. However there appears to be some room for it in the list of efficient agents. It appears to be of benefit in the treatment of senile asystole, whereby diuresis is established within 24 hours after its administration, and the œdemic and uræmic symptoms disappear. Prolonged administration is not called for and generally is objectionable. It is followed up by systematic treatment with potassium iodide which brings relief. A subsequent appearance of the œdema calls for a repetition of the same course of treatment. The headache, nausea, vomiting and cerebral disturbance frequently noticed, vary in individual cases, thus showing the lack of uniformity in its action.

An English manufacturing firm has offered a mixture consisting of :

Theobromin (Di-Methyl-Xanthin)
Sparteïn Sulphate
Colomel
Camphor

under the name of "Parahydropin," offered in the form of a colorless, insoluble powder put up in cachets. It would appear that Caffein had been used in a similar combination, for it is pointed out that as the composition of Caffein is Tri-Methyl-Xanthin, the one less Methyl radical renders the Theobromin less apt to affect the nervous system, and thereby form a longer period of sleep.

Thioform (so-called Bismuth Di-Thio-Salicylate)—a combination of Bismuth, Sulphur and Salicylic Acid—one of the substitutes for Iodoform has not been heard of in the current medical literature of the past year.

Thiol (synthetic Ichthyol) is still before the profession. It continues to be found useful in burns of varying degrees. Some little experience has been had with it in fissures of the nipple, incipient mastitis, varicose dermatitis of the leg, pruritis vulvæ and quite a

long list of similar affections. The topical applications have taken various forms, all of which have proved efficient in the individual cases.

Thiosinamin (Allyl-Sulpho-Carbamide) has not received as much attention in the current literature of the year as in the previous year. However the most prominent mention has been that of Dr. Sinclair Tousey of New York City who has continued his observations for the past three years, and now contributes another article under the head of "Thiosinamine: A Further Study of its use in the Treatment of Keloid, 'Inoperable Tumors,' and Cicatricial Conditions, Including Deafness," in which he states:

"I write further upon the subject in order to answer a number of inquiries, and also to record the ultimate results in the cases already described. In addition thereto, a number of later cases in my own practice and that of others will be reported," and concludes as follows:

"It would appear from what has been said that thiosinamine sought out the disease, in whatever part existing, and destroyed it. This sounds rather extravagant, but mercury and arsenic and iodide of potassium and a good many other drugs might be said to have the same power. The idea is that this drug sets up an unusual cellular activity in the blood and in the lymphatic and connective tissues which are the nurseries of leucocytes; and that lowly vitalized tissue (*e. g.*, cicatricial tissue) is affected wherever it may be located.

The bibliography of thiosinamine is complete as given at the conclusion of my first article, with the addition of my article in the *New York Medical Journal*, May 2, 1896; Dr. R. C. Newton's, in the *New York Medical Journal*, March 20, 1897: and my remarks on page 397 of the same number of the *Journal*." (*N. Y. Medical Journ.*, Vol. LXVI, page 624).

Thymoform is the name which has been adopted for the condensation product of Thymol and Formaldehyde. It appears as a yellow, quite tasteless powder with a faint odor of Thymol. It is insoluble in water, but readily soluble in ether, alcohol, chloroform and olive oil. When combined with Iodine in the attempt to make it a convenient substitute for either Iodoform or Dermatol, it is known under the name of "Iodo-Thymoform." This latter product is yellow in color and nearly odorless. It is readily soluble in glycerin as well as in chloroform, ether and olive oil. The method of its preparation has been patented. There have been as yet no clinical reports from this product.

Thymol (Propyl-Meta-Cresol)—official—need hardly be commented upon here except in the way of mentioning one or two uses which are a little out of the ordinary.

Dr. Numa Campi reports having made successful use of it as a tæniacide, particularly against the ankylostoma duodenale. He carries out the following plan: 15 grammes (about 4 drachms) of Castor Oil are given some little time after the last meal of the day. Then the next morning treatment begins with the Thymol in 650 milligramme (10 grain) doses every quarter of an hour, and after twelve doses have been given another dose of Castor Oil is taken. At times the depressing influence of Thymol has to be counteracted by the administration of some stimulant. Aside from this the action is prompt and effective and pronounced by Dr. Campi as quite complete. (*Journal de Médecine de Paris*, Vol. X, second series, page 366).

Dr. Ernst Fischer of Strassburg, Germany, has made use of this agent in the treatment of pertussis in five of his own children. He, however, made use of a proprietary preparation called "Pertussin" which professes to be the Thymol Extract prepared in a special way by a Berlin chemist. The mixture consists of Thymol 1 part, and Syrup 7 parts, making a brownish syrupy liquid with an aromatic odor. His children took it well in doses varying from 8 to 15 grammes (2 to 4 fluid drachms) three times each day. The effect was quite marked in that the disturbing cough was promptly relieved and the cyanotic attacks rapidly diminished in number. This occurred after other agents had been tried with no results. He pushed his investigations with this mixture in the treatment of chronic catarrh of the larynx and bronchi with good results. Emphysema was much relieved also by this mixture. (*Deut. Med. Wochenschr., Therap. Beilage*, Vol. XXIV, page 49).

The above doses of Dr. Fischer were so large that Dr. Thomas Rutherford of Kelso, Scotland, took pains to write to the Editor of the *British Medical Journal* (Vol. II for 1898, page 1020) commenting upon them. He writes as follows:

"The doses are undoubtedly large, and many would rightly hesitate to employ them. The dose of thymol is usually put down at from $\frac{1}{2}$ to 2 gr., but Dr. Lauder Brunton places the higher limit at 10 gr. The largest doses up to 30 gr. have been used in ankylostomiasis, but here, as Dr. Patrick Manson in his recent textbook on tropical diseases points out, certain precautions should be adopted. Thus the patients must not take any solvent of thymol such as

alcohol, oils, etc., after the administration of the remedy. Dr. Manson also refers to some recorded cases of fatal poisoning by thymol, and states that an equally efficient but safer drug is a desideratum in the treatment of ankylostomiasis. The comparative innocuousness of thymol is due to its insolubility. It is employed in ankylostomiasis merely on account of its local vermifugal effect, but in whooping cough it could only exercise a beneficent action, if any, when absorbed. At this point of absorption the possible dangers of poisoning must be reckoned with."

Thyroid Extract (Thyro-Iodin) still assumes a very important position among the agents used by the medical profession at this time. It continues to have its enthusiastic advocates, and quite a considerable circle of skeptics, and at times an increasing number of opponents.

The most favorable report in this line of study was made by Dr. R. H. Cunningham of the College of Physicians and Surgeons, New York City, as far back as August 1896 when he offered the results of his observations in an article entitled "Experimental Thyroidism" which was not published until March of this year and appeared in *The Journal of Experimental Medicine* (Vol. Third, page 147). Although this delay was much regretted by all concerned, still the work is monumental in its character and the principles laid down need little change at this date. An appendix was added of much value and is introduced as follows: "As practically the whole of this paper was already written before the publication of the second contribution of Baumann and Roos, in which is described the method of preparing the principle 'thyro-iodine,' which they consider to be the active substance of the thyroid gland, my experience with that body must be related briefly in this appendix.".....

He concludes as follows:

"From the results of the various experiments already detailed I feel justified in drawing the following conclusions:

(1) Absolutely fresh thyroid gland is not poisonous, in the usual sense of the term, when absorbed through the alimentary canal.

(2) The symptoms of induced thyroidism are manifestations of an intoxication resulting from the ingestion of decomposed thyroid material, a conclusion that agrees in part with the previously related observations of Lanz.

(3) The so-called experimental thyroidism is not specific for the thyroid only, for the ingestion of many substances derived from

animal tissues other than the thyroid gland may produce an intoxication strikingly similar in every respect to that of experimental thyroidism.

(4) Most, if not all, animal tissues yield substances which, if injected in large quantities directly into the circulation or beneath the skin, will produce an intoxication often very similar to that produced by injections of various substances derived from the fresh thyroid tissue.

(5) The effects resulting from the intravascular or subcutaneous injections of aqueous extracts, decoctions and the concentrated extractives of the thyroid tissue, of the thymus, of muscle, etc., are by no means necessarily indicative of the function and the action of the hypothetical internal secretions of the same tissues during life.

(6) The utilization of the fact that ingestion of decomposed thyroid material produces on certain occasions an intoxication with certain symptoms similar to some of those of Graves' disease is not justifiable for the furtherance of the theory that the symptoms of exophthalmic goitre result from an over-production of the thyroid secretion.

(7) Our results lead us to conclude with Drechsel that the fresh thyroid tissue yields at least probably two substances that are capable of palliating the symptoms of the acute cachexia in totally thyroidless dogs.

(8) The thymus tissue also yields one and probably two substances that are as equally capable as the thyroid extractives of palliating the acute cachexia in totally thyroidless dogs.

(9) Neither of the above substances is an enzyme, nor does either contain iodine.

(10) Neither the feeding of minced raw thyroid glands, nor the injection of aqueous thyroid extracts, decoctions, and concentrated solutions of the extracted palliative thyroid principles is capable of keeping *totally thyroidless* young dogs alive longer than a few weeks (possibly three weeks). Still less capable are the thyroid preparations containing decomposition products.

(11) The presence of one, or usually several, small accessory thyroid bodies, which gradually hypertrophy and wholly or partially assume the functions of the excised thyroid lobes, accounts for the occasionally long survival of thyroidectomized, thyroid-fed, young dogs.

(12) Totally thyroidless young dogs are so quickly overwhelmed

by the cachexia, and the intervals between the thyroidectomy and the onset of the severe dyspnoëic attacks and subsequent deaths differ so slightly, no matter which of the usual varieties of fresh food are employed, that *kinds* of fresh food cannot be unquestionably affirmed to influence the onset of the cachexia in any especially definite manner. Animal foods, in which constituents poisonous to rabbits have developed, probably slightly hasten the onset of the severer symptoms, and the vaunted remarkably modifying influence of a diet of ordinary milk, such as Breisacher observed, does not exist in the case of the totally thyroidless dog.

(13) Monkeys whose general metabolism is disturbed in consequence of the removal of a greater portion of the thyroid gland, evidently become more susceptible to those constituents of meat that are poisonous to rabbits, and sufficient clinical evidence exists for concluding that probably a like susceptibility to animal foods containing such constituents also exists in men when the function of the thyroid gland is sufficiently disturbed.

(14) And, finally, as regards the thyroid factor in the pathology of exophthalmic goitre, I agree with Gley that the majority of the symptoms in many patients with that disease can apparently, from an experimental standpoint, be as plausibly explained by the hypothesis of partially *deficient* thyroid activity as by the hypothesis of augmentation of thyroid function."

In line with the results of the above observations, the report of Mr. William MacLennan of Glasgow, Scotland, "On the Treatment of Obesity and Myxœdema by a New Preparation of Thyroid ('Thyroglandin')" is of interest. He concludes as follows :

"The very active therapeutic properties which are exhibited by thyroglandin lead me to believe it is a preparation of great value. If it really represents all the active constituents present in the gland in their correct form and proportion, it may prove a very useful addition to our thyroid preparations." (*Brit. Med. Journ.* Vol. II for 1898, page 79).

One of the most prominent writers of the year was Dr. Robert Hutchison of London, England, who has investigated "The Pharmacological Action of the Thyroid Gland." He introduces his subject as follows :

"The recent promotion of the thyroid to an official position in the *British Pharmacopœia* makes this a suitable time to state what is known as to its pharmacological action. More especially is this the case owing to the fact that the literature relating to the thyroid

has recently swelled to such enormous proportions that he who runs is certainly no longer able to read it, whilst embedded in that literature there are yet a number of facts and observations which have a very direct bearing on the therapeutic use of the substance. It may, therefore, be permitted to one who, from the special nature of his own investigations, has been obliged to read all that has been written on the subject, to discuss briefly the present state of our knowledge as to the physiological effects of the administration of the thyroid, and the bearing of that knowledge upon its use as a medicinal agent."

He divides his subject into four heads :

I.—Effects upon Metabolism.

II.—Effects on the Circulation and Blood.

III.—Excretion of the Active Constituent of the Thyroid.

IV.—Dosage of Thyroid Preparations.

He feels called upon at the close of his article to add the following postscript :

"Since the above article was written there has appeared in this Journal (July 9th, 1898) a paper by Dr. William MacLennan describing a new thyroid preparation ('thyroglandin'). As that paper contains a number of what (in my judgment) are serious errors as to the facts of the chemistry of the thyroid and the nature of its active constituent, I feel that I ought to make a short reference to it. Dr. MacLennan asserts that the thyroid contains two important principles—an iodoglobulin and iodothyryn—and that both of these are requisite to produce the specific effects of the gland itself. This assertion is quite unfounded in fact. As I have shown elsewhere, the fresh thyroid contains only one iodine-containing compound—namely, the colloid matter. This consists of a proteid part (possibly a globulin) combined with an organic compound of iodine (crude iodothyryn), and the latter compound is split off on hydrolysis of the colloid. The specific effects of the thyroid can be produced by the administration either of the colloid matter as a whole or of the iodothyryn split off from it. The effects produced by both preparations are identical, provided an equivalent dose of each is employed. Further, the colloid matter contains all the activity of the thyroid, the extractives being incapable of producing any of the specific effects of the gland.

It is not the case that all of the processes which have been devised for separating the active constituent of the gland result either 'in the destruction of the iodoglobulin entirely, or in the partial

separation of the iodothyrim only.' In the preparation of the colloid matter, as described by myself, the glands are extracted with dilute caustic soda without the aid of heat. The colloid matter is so soluble in alkalies that it goes entirely into the solution, and if any traces of iodothyrim happen to have been split off from it in the gland, these are also dissolved. The subsequent addition of acetic acid throws down the colloid, and it is afterwards dried without having undergone any decomposition whatever. Furthermore, this separation is accomplished without any other substance of "a useless or objectionable nature" being contained in the final product.

The process which Dr. MacLennan describes as that by which 'thyroglandin' is prepared will be perceived at once by anyone conversant with the chemistry of the thyroid to result in the extraction of the colloid matter, *plus* the salts, extractives, and any other substance which happens to be present, and which is soluble either in water or in boiling caustic soda solution. As the salts and extractives have been shown to be 'useless,' and as the other substances (for example, products of decomposition) may very easily be objectionable, I entirely fail to see the superiority of this process over those already in existence. That the product is simply an impure form of the colloid matter I entertain no doubt at all, and by the administration of $1\frac{1}{2}$ gr. of the latter thrice daily I have over and over again obtained quite as marked results as were produced by double that dose of thyroglandin. I therefore cannot regard the latter preparation as in any way superior to those with which the profession is already familiar."

Then follows a valuable Bibliography in the form of a classified list of papers bearing upon the pharmacological action of the Thyroid, which he rightly says will be a convenience for other workers. (*Brit. Med. Journ.*, Vol. II for 1898, page 142).

Dr. Hutchison's paper called forth a letter to the Editor of the *Brit. Med. Journ.* from Dr. George Murray of Newcastle-on-Tyne, England, on the question of dosage which is of sufficient value in connection with the above to quote here in full :

"Dr. Robert Hutchison's excellent paper in the *British Medical Journal* of July 16th on 'The Pharmacological Action of the Thyroid Gland' will I am sure be read with interest by many. There is, however, one statement with regard to the dosage of liquor thyroidei with which I am unable to agree. Liquor thyroidei is simply the original liquid thyroid extract devised and described by me in 1891, which the new Pharmacopœia Committee has paid me the compliment of

adopting, unaltered in strength or composition as an official preparation. The dose recommended in the *Pharmacopœia* is 5 to 15 minims, which are the proper limits of an ordinary dose for an average adult. Dr. Hutchison thinks this dose is too small, and that it would be better to give the dose as 15 to 60 minims. These doses are certainly too large, as doses ranging from 30 to 60 minims are likely to produce unpleasant effects, even if given only once daily. I have constantly used this preparation for more than seven years, and have found that 10 minims of it given once daily is quite sufficient to maintain an adult who has suffered from myxœdema in good health. Thus, for example, my first case of myxœdema, who has now been treated with liquid thyroidei for more than seven years, is maintained in continual good health by this amount.

It seems, therefore, that this amount (10 minims) contains as much thyroid secretion as is daily formed and poured into the blood by the healthy gland. In some cases it appears to be even less than this, for in another case 5 to 7 minims was found to be the suitable daily dose, larger doses producing increased frequency of the pulse, etc. When this patient ultimately died from cardiac disease, microscopic examination showed that the whole of the thyroid gland was converted into fat and fibrous tissue, not a trace of glandular structure being left. In this case no secretion at all can have been formed by the diseased gland, so that the 7 minims were equivalent to the maximum amount of normal thyroid secretion. It is thus evident that the dose given by the *Pharmacopœia* is the right one. Of course this dose may be increased or repeated more frequently if it is desired, and produce a condition of thyroidism, but such doses are really toxic and beyond the ordinary range.

In conclusion, I may mention that in my opinion liquor thyroidei gives better results in treatment than the dried preparations of the gland, so many of which are now used in the form of powders and tablets." (*Brit. Med. Journ.*, Vol. II for 1898, page 273).

A prominent British pharmacist, Mr. E. C. C. Stanford reported on "Thyroglandin" at the British Pharmaceutical Conference held in Belfast, Ireland, in August last. (*Pharm. Journ.*, Vol. VII, Fourth Series, page 166).

Little further comment can be made here out of the voluminous literature on the subject than the mention of a few more of the prominent allusions.

Dr. Clement Dukes of Rugby, England, writes on "Thyroid Extract as an Aid in the Development of Backward Children" (*Brit. Med. Journ.*, Vol. I for 1898, page 618).

The results of various observers in the treatment of insanity have been rather disappointing. In a series of ten cases, one was a case of organic cerebral lesion in which the administration had to be discontinued early as it caused too much gastro-intestinal disturbance. Out of the ten cases only two benefited by the treatment and even in those some doubt was felt whether the improvement was due to the Thyroidin or whether it occurred in the natural course of the disease. Some peculiar physiological effects are spoken of as being present. The pulse was increased and there was loss of weight, but the temperature, sleep and appetite remained normal. Salivation was noted in one case and twitching of the facial muscles in another.

A discussion on the treatment of goitre was held in the Section of Medicine of the Royal Academy of Medicine in Ireland on January 28th last when Dr. Richard A. Hayes read notes of a case of acute goitre being successfully treated by this Extract. (*Brit. Med. Journ.*, Vol. I for 1898, page 500).

Dr. Wm. Walton Don of West Hampstead, England, has written an article on "The Action of Thyroid Extract on the Skin as Illustrated in Cases of Ichthyosis." He gives quite full notes of the treatment of two cases, showing in a general way their progress. He closes as follows :

"The action of thyroid extract on the nervous system in most of my cases has been depressing, patients complaining of feeling debilitated and low ; but in a case of myxœdema in which I used it its action was the very opposite.

In the above cases the results are, I think, sufficiently encouraging to warrant a more extensive trial in ichthyosis, which has hitherto proved so intractable to treatment." (*Brit. Med. Journ.*, Vol. II for 1897, page 1334).

Mr. Malcolm Morris read an Address on "The Use and Abuse of Internal Remedies in the Treatment of Skin Diseases" at the Annual Meeting of the Reading Pathological Society on October 6th last in which he commented on Thyroid Extract as follows :

"This agent has been credited with effects little short of marvelous in psoriasis and some other affections of the skin. Here, again, I am unable from my own experience to confirm the reports of Dr. Byrom Bramwell and others. The thyroid did in some cases seem to influence the condition for a time, but the effect after all was slight and extremely transient. Moreover the remedy is, especially in elderly persons with weak hearts, distinctly dangerous, and even in healthy people it is apt to cause grave systemic disorder." (*Brit. Med. Journ.*, Vol. II for 1898, page 1117).

Dr. Frederick Page and Mr. William H. Bishop of Newcastle-on-Tyne, England, have offered a contribution on "Recurrent Carcinoma of the Female Breast Entirely Disappearing under the Persistent use of Thyroid Extract Continued for Eighteen Months." This is a comparatively new line of treatment, but the one case related simply gives encouragement for other trials. They conclude their remarks as follows :

"During the eighteen months that the treatment was persistently followed it was found necessary occasionally to suspend the use of the drug for some days on account of its toxic effect. The patient is now quite well. She has gained flesh and health to such an extent that it is difficult to believe that she is the same person who was operated upon two years and four months ago. There is no trace of the disease to be discovered." (London *Lancet*, Vol. I for 1898, page 1460).

Dr. G. Ernest Herman of Harley-street, London, W., England, has reported "A Case of Recurrent Cancer of the Breast Treated by Oöphorectomy and Thyroid Extract" after which he concludes as follows :

"I have since treated some cases of uterine and vaginal cancer by oöphorectomy and thyroid extract, but the results are not yet complete enough for publication." (London *Lancet*, Vol. I for 1898, page 1612).

A new preparation has been obtained by precipitating from the Thyroid Gland the Iodo-Albuminates, bases and mucous membranes by means of Tannin. This preparation has been given the name of "Aiodin." It is claimed to be very rich in Iodine. Dr. Otto Lanz of Bern, Switzerland, has experimented with it on dogs as well as human subjects with gratifying results. (*Berlin. klinische Wochens.* Vol. XXXV, page 371).

Mr. Charles A. Bois and Mr. Neil T. Kerr, Medical Officers of Lanark County Asylum, Hartwood, England, read a report of their investigations on "Clinical Studies with Spleen and Thyroid Extracts" before the British Medical Association at its Annual Meeting in Edinburgh in July last, which will be of interest to those who desire to follow up the general line of treatment with extracts. (*Brit. Med. Journ.*, Vol. II for 1898, page 684).

In close relation to investigations with the Thyroid Gland will be found the results in the treatment with Thymus Gland, but Dr. Helm of Tangermünde, Prussian Saxony, has to report the death of a child due to Thymus Gland. (*Deut. Medicin. Wochens.* Vol. XXIV, page 303).

A fitting close probably to this whole subject is what Dr. H. C. Wood of Philadelphia, Pa., has to say in regard to this line of treatment. He published the following "Note on Thyroid Extract" :

"One who has followed the history of the use of drugs of animal origin must thereby have acquired skepticism. The clinical results which have followed the administration of thyroid extract, however, in myxedematous and allied cases would seem to be sufficiently established and pronounced to justify absolute belief in the potency of this substance as a therapeutic agent. Nevertheless, in his recent very elaborate research, Dr. Cunningham believes that he has demonstrated that the symptoms of thyroidism, so-called, are not produced by any substance which exists originally in the thyroid gland, but that they are the outcome of toxins, ptomains, or other poisonous organic principles, which are the result of post-mortem changes in the gland; and he further affirms that whilst these extracts hasten the death of the dog that has suffered complete thyroidectomy, even feeding such an animal on the fresh thyroid gland fails to put aside sensibly the fatal issue; statements apparently founded upon good experimental evidence and which certainly tend to befog what we had supposed to be clear knowledge.

Under such circumstances, I hesitate very much even to report clinical facts bearing upon the subject; nevertheless, 4 recent cases seem to me to be worthy of being noted, although the happenings may have been coincidences. In these 4 cases the exhibition of thyroid extract has been followed by violent outbreak of gouty or rheumatic symptoms, not existent at the time at which the drug was given. In one of these cases the patient never had had rheumatic symptoms before to her knowledge. In a second case, that of Mrs. D., the patient was of distinctly gouty tendency, had had from time to time gouty attacks, but was free from any lithemic or arthritic symptoms when I first unsuspectingly gave her thyroid extract for obesity. In about 10 days or 2 weeks she had a violent outbreak, confining her to bed. She was taken off the thyroid, put on appropriate treatment, and rather rapidly convalesced. An anti-lithemic diet was insisted upon and maintained. April 10th or 11th she began again to take 5 grains of thyroid extract 3 times a day, being at that time in greatly improved health and without evidences of diathesis. To-day, April 20th, her sister reports at the office that Mrs. D. is in bed, with great pain and swelling in the ankles as before. Miss M., another case, was a young lady, about

16 years of age. She had once in her life suffered from slight rheumatic symptoms. She came under treatment for recently developed goiter, dermatographia, and various nervous symptoms. About February 22d, she was put upon 9 grains a day of extract of thyroid, increased about March 1st to 15 grains, and decreased March 7th to 6 grains. March 11th she had a severe rheumatic outbreak. The thyroid extract was withdrawn, a simple tonic given; the rheumatism rapidly disappeared. On March 22d, she was again put on thyroid extract, which was followed in about 10 days by a return of the rheumatic symptoms.

My object in reporting these cases is not to claim that the extract of thyroid was the cause of the rheumatic symptoms, but simply to call the attention of the profession to the subject, so that careful observation may be made upon a wider scale." (*Philos. Med. Journ.* Vol. I, page 1012).

Toxins (meaning all the morbid substances produced by living beings) are still receiving attention from critical observers, but few direct comments have been made upon them. One detailed study, however, is worth noting here, and that is a paper by Dr. Alfred Salter of Sudbury, Middlesex County, England, on "The Elimination of Bacterial Toxins by Means of the Skin, with Especial Reference to the Presence of Tuberculin in the Sweat of Phthisical Patients" in which he draws the following conclusions: "The above experimental evidence seems to me to have a practical bearing upon therapeutics inasmuch as it furnishes a rational basis for the old empirical method of treatment—viz., that of 'sweating a fever.' The artificial encouragement of the sweating no doubt assists in the elimination of the toxin by way of the skin leaving less behind to poison the tissues. I hope in a further communication to detail the results of the experimental examination of the sweat of patients with acute rheumatism, which I hope will assist in throwing some light upon the nature of the rheumatic toxin." (*London Lancet*, Vol. I for 1898, page 152).

This was followed by a criticism of the above deductions by Dr. David Walsh of the Western Skin Hospital, London, W., England, under the head of "A Note on the Elimination of Bacterial Toxins by the Skin" in which he states:

"In conclusion it may be as well to add that I do not for a single moment suggest any doubt as to the absolute originality of Dr. Salter's valuable research. So far from that I welcome his contribution as most telling confirmatory evidence in favour of my own

views. At the same time I have ventured to make the above comments, as it is desirable for all who undertake a work of this importance to have at least a general acquaintance with the drift of previous writings upon the subject." (London *Lancet*, Vol. I for 1898, page 362).

Trional (Di-Ethyl-Sulphon-Methyl-Ethyl-Methane) — closely allied to Sulphonal—is still a close rival to Sulphonal and finds its application where the Bromides and Chloral are less advisable. Dr. Habermann of Wismar, Germany, recommends an agreeable and convenient way of administering it. Finding that Trional is readily soluble in water containing carbonic acid under pressure, he made a series of investigations in this line with alkaline waters. He has found that hypnotic effects are produced with much smaller doses when given in this way, and would urge extended trials of this form of administration. A water is selected containing the principal constituents of seltzer, and Trional is introduced in the proportion of 1 gramme (15.4 grains) to 330 Cc. (a little over 11 fluidounces). Dr. Habermann has obtained very satisfactory results with at least one-half and frequently with one-third of the ordinary dose, and given in this way would correspond to from 500 to 330 milligrammes (7.7 to 5.5 grains). He was thus not only able to decrease the dose, which is a proper proceeding on general principles, but he found that when given in these small doses rapid elimination occurred and thus disagreeable after-effects were avoided. Again he found that he could prolong his treatment better and thus avoid the cumulative effect which it is known to have. (*Allgm. Med. Central-Zeitung*, Vol. 67, page 389).

Unfortunately poisoning cases are still prevalent. Dr. Fontoy-nont calls attention to the fact that so-called chronic poisoning is much more serious than the acute cases. He notes that such cases are more frequent in women by reason of their well-known addiction to constipation, which condition is known to favor accumulation of toxic material. He points out the fact that the peculiar empyreumatic odor of the urine in such cases, resembling acetone, is quite pathognomonic. (*La Presse Médicale*, Vol. 5, second half, page 307).

Tuberculin (Parataloid) has been considerably talked of and written upon throughout the past year. All the literature, however, has almost entirely been confined to the New Tuberculin of Koch (TR). Opinions have differed much and the enthusiastic reception which it received at first has been much dampened by

subsequent observations, so that at this date little enthusiasm is noted, except possibly in the immediate neighborhood and among Koch's warm admirers, in his section of the world.

A report was recently circulated to the effect that the manufacture of the New Tuberculin had been discontinued, but this was afterwards denied. It is admitted that its distribution has been somewhat restricted, owing largely to this rumor.

At an annual meeting of the Section of Medicine of the British Medical Association held in Edinburgh on July 27 last, Dr. McCall Anderson of Glasgow, Scotland, read a paper entitled "A Plea for the more General Use of Tuberculin by the Profession," in which he concludes as follows :

"It is the almost universal experience of those best qualified to judge that, when employed in suitable cases, and with all due precautions, improvement results from the use of tuberculin. It is, however, the experience of many that this improvement is but too often temporary, the morbid condition relapsing sooner or later after the treatment is stopped. The accuracy of these observations cannot be gainsaid, but it appears to me that sufficient weight has not been given to the circumstance that two factors have to be taken into account in dealing with tuberculous disease : (*a*) the tubercle bacillus; and (*b*) the soil favourable to its life and development. It is obvious, then, that in addition to the use of tuberculin, means must be simultaneously taken to change the soil upon which the micro-organism flourishes by means of good food, pure air, cod-liver oil, and other antistrumous remedies, if we would hope to obtain permanently successful results." (*Brit. Med. Journ.*, Vol. II for 1898, page 944).

Dr. A. C. Klebs of Chicago, Ills., and of Citronelle, Ala., read a paper before the Boston Society for Medical Improvement on December 27th last, entitled "The Diagnostic and Therapeutic Value of Tuberculin and Its Derivatives" in which he summarizes his conclusions on Tuberculin as follows:

"(1) That tuberculin is a most valuable aid in the diagnosis of early human tuberculosis, with due observation of limitations.

(2) That there is no danger in its application as a diagnostic test.

(3) That a tuberculin prepared always after the same method and standardized by previous animal tests should be used in order to insure uniformity of results.

(4) That the therapeutic value of the crude tuberculin is limited by its injurious by-effects.

(5) That the method of preparing the new tuberculin of Koch makes it impossible to exclude contamination with other bacteria and therefore renders it dangerous for *therapeutic* purposes.

(6) That also a non-contaminated preparation of new tuberculin offers the same and even greater dangers in its application as a *remedy*.

(7) That by elimination of certain toxic substances from any of the tuberculin preparations (or perhaps by their passage through an animal body), a preparation (tuberculocidin) can be obtained, curative properties of which can be demonstrated in animal experiments, and which seems to influence beneficially early cases of pulmonary tuberculosis.

(8) That we have no remedy and probably never will have a remedy of absolute certainty in tuberculosis in its different stages; and that the eradication of the disease can be successfully attempted only by the united efforts of the different communities; by rigidly enforced methods of prevention; by isolation of already infected cases in well-directed special institutions and by the general education of the public on the subject—in one word, by a sincere fight, like the one now so successfully undertaken in this State of Massachusetts.” (*Boston Med. and Surg. Journ.*, Vol. CXXXVIII, pages 121 and 150).

The discussion which followed is of interest and will be found in the same Volume (page 132).

In detecting tuberculosis in cattle, the Boards of Health in various foreign countries and in some of the States of our own country continue to make good use of this agent. A report comes from New South Wales that they have been making use of it for two years past with great advantage. They admit that it is not infallible, but the percentage of errors when properly used is quite small. They claim that many of the unsatisfactory results previously reported arise from the disregard of some of the simple details in its use. Most Boards of Health establish certain rules to be observed and tabulate their records. It is urged that some uniformity in method be secured, so that after a time by comparison of records some precise results as to the value of this method may be obtained.

Dr. Zimmermann has reported the case of a man suffering from so called ocular tuberculosis. Tuberculosis developed in his right eye five years after the enucleation of the left for the same trouble. It was finally established by microscopic examination, that the first eye was so affected, that there was no doubt as to the nature of the disease in the second eye. The New Tuberculin was administered

beginning with $\frac{1}{500}$ of a milligramme and increased gradually with such favorable results, that he was pronounced "cured." To establish this latter conclusion Dr. Zimmermann made a series of experiments on rabbits inoculating their eyes with a virulent culture and then injecting the New Tuberculin. His experiments as now reported were not complete, but as far as he had gone he concluded that this Tuberculin had a real specific anti-tuberculous action. (*Société française d' Ophthalmologie*, Vol. III, new series, page 519).

In an Address on "The Use and Abuse of Internal Remedies in the Treatment of Skin Diseases" delivered at the Annual Meeting of the Reading Pathological Society, October 6, 1898, Mr. Malcolm Morris, Surgeon to the Skin Department of St. Mary's Hospital, London, England, thus alludes to his conclusions on Tuberculin:

"Although tuberculin is not in strictness an "internal remedy," it still less comes under the head of local treatment. I may, therefore, say a few words about it here. I have given it both in its original and in its improved form (TR), and I am compelled on the whole to report against it. In lupus it undoubtedly modifies the process in a marked degree for a time, but the effect is not lasting. The new tuberculin at first appeared to act like a charm, and I confess I was deeply impressed by the immediate results. But the new tuberculin has already proved as disappointing as the old; in all the cases in which it seemed at one time likely to effect a cure the disease has recurred and their last condition is just as bad as their first. One good effect may, however, be claimed for tuberculin. If used as a preliminary to surgical treatment it modifies the process in some way which I do not profess to explain, but which makes surgery more permanently effectual than it otherwise would be.

Of the serum treatment as applied to syphilis, leprosy, and one or two other affections I am unable to speak from any experience of my own. I may say, however, that the reports of those who have tried the remedy do not encourage me to follow their example at present." (*Brit. Med. Journ.*, Vol. II for 1898, page 1117).

Dr. A. Ravogli of Cincinnati, Ohio, has made a study of this agent in dermatology and read a paper on the subject at the Twenty-third Annual Meeting of the Miss. Valley Medical Association held in Louisville, Ky., in October last. He drew the following conclusions:

"(1) Tuberculin is a valuable aid in dermatology, both as a diagnostic and therapeutic agent. (2) In lupus it acts remarkably well

as a systemic treatment, particularly in conjunction with other means for the purpose of reducing infiltrations. (3) After a large number of injections he has never observed any bad effects. (4) Old tuberculin had given more marked reaction, both general and local, than the new. (5) In cases over which no remedy had an influence, tuberculin promptly caused a disappearance of the eruption, healing of the ulcerations, and a general improvement in the condition. (6) If relapses occur after discontinuing the use of tuberculin the remedy should not be blamed. (7) To insure recovery, tuberculin must be used in small doses, administered at short intervals, and employed for a considerable time." (*Medical News*, Vol. LXXI, page 546).

Dr. von Lingelsheim, working in Prof. E. Behring's Institute for Experimental Therapeutics at Marburg, Prussia, has studied the subject in the line of estimating the strength of tuberculous toxins, and reports his results in a paper entitled "Determination of the Activity of the Tuberculous Toxins." (*Deut. Med. Wochensch.*, Vol. 24, page 583).

"Oxytuberculin" is still being discussed by other observers than the originator, Dr. J. O. Hirschfelder of San Francisco, California. The results obtained by some observers were thought so important that a Committee of the Faculty of the Cooper Medical College made a report on this so-called Hirschfelder treatment and their conclusions were as follows:

"(1) Oxytuberculin prevents the growth of tubercle bacilli in veal bonillon; (2) a positive therapeutic value has been demonstrated for it in the fifteen cases examined, the more clearly as no other treatment was used; (3) no dangerous or untoward effects have resulted from its use; and (4) it has been legitimately brought before the profession since a full description of its mode of preparation has been published, thereby putting it within the reach of all.

Finally the committee feels justified in certifying these facts to the profession to the end that oxytuberculin may be thoroughly tested, the limits of its successful application determined, and its place in therapeutics established at the earliest possible time. While some remarkable results have been obtained in advanced cases no claims are made for the later stages of the disease." (*London Lancet*, Vol. I for 1898, page 179).

In a subsequent paper, Dr. Hirschfelder made an additional report enumerating fourteen cases in clinical detail that were

presented to the above Committee. (*Jour. Amer. Med. Asso.*, Vol. XXX, page 299).

Following this paper is one entitled "A Clinical Study of Tuberculous Cases Treated with the New Antiphthisic Serum T. R." according to the formula of Fisch, by Dr. A. Mansfield Holmes of Denver, Colo., in which he enumerates the clinical results of ten cases, and closes with the following statement :

"The climate alone, in nearly all of the foregoing cases, relieved the symptoms after the patients came to Colorado. The improvement, however, was marked but not complete, many arriving at a certain point then cease to improve.

The climate in such cases exhausts its power and they either remained apparently stationary or begin to lose ground.

Hence, I believe that the effects produced upon the majority of the foregoing cases show conclusively that the best means for bringing about continuous and permanent improvement in tuberculous cases, is to be found in the new antiphthisic serum T. R., aided by a properly selected climate." (*Journ. Amer. Med. Asso.*, Vol. XXX, page 303).

Professors F. Ramond and P. Ravaut communicated to the Paris Biological Society on May 28th last the results of their experiments with a new Tuberculin cultivated from the bacillus tuberculosis of fish in a bouillon containing both glucose and glycerin. After filtering these cultures through porcelain, the toxin they obtained exactly resembled the tuberculin obtained from the human bacillus tuberculosis. They experimented with this new toxin in guinea-pigs proving the above similarity.

The startling statement has been made against Koch's New Tuberculin that living tubercle bacilli may be obtained from it. This has astonished many and has not been very fully explained.

Many recent reports are unfavorable to the New Tuberculin, for it is noticed that the disease often continues unaffected by the injections made. Dr. Hermann Stempel of Greifswald, Prussia, makes such a report (*Muench. Med. Wochensch.*, Vol. XLIV, page 1347) undoubtedly based on reports to this date. The greatest benefit has been derived when used in the treatment of lupus, and most of the enthusiasts obtained their best results in this affection. Dr. Albert Spiegel of Taunus, Germany, has obtained similar results to Dr. Stempel only considerably more disappointing, for he very definitely states that the improvement noticed was undoubtedly due to the favorable hygienic influences offered to the patients. (*Muench. Med. Wochensch.*, Vol. XLIV, page 1470).

Doubtful conclusions also are reported by Dr. H. Reinhold of Hannover, Germany, in an article entitled "Clinical Experiences with the Therapeutic Employment of the New Tuberculin TR." (*Muench. Med. Wochensch.*, Vol. XLV, page 681).

Dr. Huber of Berlin, Germany, also concludes from his observations that this agent is neither harmful nor beneficial, and therefore that the results seen at times after its use may well be assigned to the improved hygienic conditions, together with diet.

Uranium Nitrate has not been commented upon much more during the past year than in the year previous. The most prominent article mentioning its use directly was by Dr. C. Hubert Bond of the London County Asylum, Banstead, England, entitled "Remarks upon the Value of Uranium Nitrate in the Control of Glycosuria" (*London Practitioner*, Vol. LXI, page 257). He enumerates 9 cases with a short description of each, and states that they are in addition to the 32 previously published cases.

Uranium Acetate in the proportion of about 1 to 10 of distilled water has been recommended in the treatment of eoryza; two or three drops are snuffed up daily.

Urotropin (Hexa-Methylene-Tetramin)—formed by the union of Formalin and Ammonia—is apparently still in use, for reports have been made upon it during the past year.

Dr. J. Cohn working in Dr. C. Posner's Polyclinic in Berlin, Germany, has made observations on the use of this agent in various forms of cystitis which will be interesting to read for those who desire to follow up this line of treatment. (*Berlin. klin. Wochensch.*, Vol. XXXIV, page 914).

Dr. Leopold Casper of Berlin, Germany, has continued to make use of it experimentally and clinically. He finds it of much value in cutting short the attacks of renal colic, and their recurrence is much lessened. The clearing up of the urine is prompt even though it may have been opaque for many years. It undoubtedly splits up in the system and Formalin is found not only in the urine but in the blood. He expresses himself very decidedly on its benefits in cystitis. (*Monats. über die Gesamt. auf dem Gebiete der Krankh. der Harn-und Sexual-Apparat.*, Vol. III, page 1).

Dr. Albert Citron of Berlin, Germany, has gone deeper into the study of this question of the appearance of Formalin in the urine, and after investigation concludes that, although there does appear to be a certain substance appearing in the urine having the chemical properties of Formalin, he is in doubt whether it is free Formalin.

This substance is formed from Urotropin by an acid reaction either in the kidneys or in the bladder, and to produce this reaction he finds the urine must be kept strongly acid, for it does not take place either in a neutral or alkaline urine. (*Monats. über die Gesamt. auf dem Gebiete der Krankh. der Harn-und Sexual-Apparat.*, Vol. III, page 73).

The claim by some observers that this agent is efficacious in dissolving calculi in the kidneys or bladder is refuted by others, and a prominent observer who thinks in this way is Dr. Martin Mendelsohn of Berlin, Germany. (*Berlin. klin. Wochensch.*, Vol. XXV, page 48).

There seems to be little doubt about the efficiency of this agent when used as a bactericide and urinary antiseptic, for all the observers apparently are in accord in reporting considerable satisfaction. Dr. Edmund Bonn of Prag-Weinberge, Bohemia, reports having used Sodium Salicylate, Benzoic Acid, Salol and other agents each of which completely failed him, but when using infusions of 1 to 2 grammes (15.4 to 30.9 grains) of this agent, he obtained much better results. (*Prag. Medicin. Wochensch.*, Vol. XXIII, page 208).

Validol is the name given to a combination (mixture) of Valerianic Acid and Menthol introduced as a stomachic and stimulant remedy, and exhibiting properties of much value in cases of hysteria. It has been used and strongly recommended by Dr. Georg Schwersenski of Berlin, Germany. (*Therap. Monatsh.*, Vol. XI, page 604). It is claimed to contain 30 per cent. of Menthol and is offered in the form of a colorless slightly bitter liquid of the consistency of glycerin, and with a slight but pleasant odor. It apparently is useful in all cases where Menthol is applicable. The usual doses recommended are from 10 to 15 drops on a piece of sugar when internal medication is indicated, for all forms of flatulency and hysteria. In cases of neuralgia and sciatica it may be applied topically by painting on the affected region. It has been used effectively also by inhalation.

Weights and Measures (Metric System) have advanced very markedly during the past year by reason of the progressive legislative act of the British Government, and their adoption in the new British Pharmacopœia. Parliament has thus authorized the use of the decimal system in a progressive way to the same extent as our United States Government has. Both countries therefore are on an equal footing in regard to the change in the system,

although the English Government are much behind in their authorization of its use, for the United States Congress passed the progressive act in July, 1866. The Pharmaceutical and Chemical Journals of England have taken hold of the matter in a rational way by stating that in future they propose to state all the quantities mentioned in their reading matter in terms of the metric system, giving equivalents where thought necessary and proper. They make use of the table of equivalents given in the U. S. Pharmacopœia, but naturally their fluid measures in the old system differ from those in this country, so that their equivalents in volume differ slightly. It is strongly recommended now that the most practical mode to proceed with in this new system, is to immediately secure weights and measures in that system, and learn to not only use these appliances mechanically but to think in the new system, only making use of the equivalents when necessary to convert from time to time. If the conversions are to be used every time a weight or measure is mentioned, there will be much loss of time and the liability to inaccuracies increased.

The various Consuls of those countries not now using the metric system are constantly advising their home Government of the uselessness and expense of exporters forwarding trade circulars, catalogues and price lists calculated in their individual systems to foreign countries using the metric system. The latter countries are so well satisfied with the wisdom of the change they made, some of them long ago, that trade is actually discouraged to some extent with those countries who have not yet fallen into line.

As alluded to in previous years Russia has been leading up to this change for some years and has been adopting various means to facilitate the overthrow of the old system at some fixed date. It is now reported that the Minister of Finance has obtained Imperial authority to make definite preliminary arrangements for the accomplishment of this change.

In Turkey, even, the proposal to permit the use of this system alongside of their present one is now being seriously considered.

Xeroform (Tri-Brom-Phenol Bismuth)—another substitute for Iodoform—has not been commented upon quite as much in the past year as previously, but it is still thought considerably of in some quarters. Dr. Heinrich Paschkis claims it to be of much value in the treatment of certain skin affections. He has written a somewhat extended paper upon its use. (*Wien. klin. Rundschau*, Vol. XI, page 693). He enumerates in tabular form 62 cases of

venercal ulcer, 5 cases of herpes, 6 cases of eczema, 5 cases of ulcer of the leg and 4 of burns—in all of which he obtained excellent results. Superficial ulcers and erosions healed up in a very few days. He lays little claim to any antiseptic action of this agent, but thinks it a remarkably effective dressing, favoring healthy granulation and cicatrization.

Dr. Hermann Metall of Vienna, Austria, lends his testimony to the good results obtained with this agent in various forms of venercal diseases. (*Wien. Med. Presse*, Vol. XXXVIII, page 1214).

Dr. Ehrmann of Vienna, Austria, reports his continued use both internally and externally in his dermatological clinic for over a year, stating that he finds it one of the best and most reliable of the antiseptics externally, and equally efficient throughout the intestinal tract. (*Wein. Medizin. Blätter*, Vol. XXI, page 343).

Dr. Marcinowski of Siegmarsdorf, Germany, reports his preference for this agent over Iodoform in the treatment of corneal ulcers. He turned his attention in the direction of Xeroform after having succeeded in a case which had previously given poor results with Iodoform, and has since used the former almost entirely, with quite uniformly good results. He reports that all his wounds heal rapidly leaving no scars. (*Therap. Monats.*, Vol. XII, page 385).

ON ACETIC ACID AS A SUBSTITUTE FOR ETHYL ALCOHOL IN EXTRACTING THE ACTIVE PRINCIPLES OF SOME OFFICIAL DRUGS.

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(FIRST PAPER.)

In the proposed substitution of acetic acid for alcohol as a menstruum for extracting and a vehicle for preserving and administering the active principles of drugs used in medicine, the very first question is as to the therapeutical equivalency. That is, if the presence of the necessary amount of acetic acid in fluid extracts, etc., can be shown to be therapeutically objectionable, or more objectionable than the necessary amount of alcohol, then it is not proper to make the substitutions.

But acetic acid has long been used for the extraction of cantharides, colchicum, ipecacuanha, opium, squill, etc., without developing any known therapeutical objections, and in a limited experience in the extraction of spices, and of some drugs for veterinary use, it gives extracts practically identical with those from alcohol. The acid has a universally accepted food value, not only as a hydrocarbon, but as a mild acidulous aid in the primary processes of digestion, but in the small quantities that would be present in the doses of fluid extracts, it would be practically inert, or at least as nearly inert as the alcohol which it would replace.

Its properties and value as an antiseptic, detergent and preservative are well known, but whether it would be present in sufficient proportion to preserve such preparations from change during a long time has not yet been determined. The oldest set of samples, made with 10 p.c. acid, are now about two years old and apparently unchanged. Fluid Extract of Ergot, by the officinal process, is preserved by acetic acid in small proportion, as first proposed and used by Prof. Wm. Proctor, Jr., in 1857, and in that case an alcoholic preparation very liable to change has been made permanent.

*This paper must be credited to the *American Journal of Pharmacy*, as it was first published in that journal, Vol. 71, No. 1, p. 1, 1899.

Fluid extracts made with acetic acid menstrua are much more loaded with inert extractive matter than when made with alcohol; and this is a disadvantage, but hardly hurtful, nor more than an inconvenience occasionally.

In compounding prescriptions the acetic acid menstruum has a slight general advantage over alcohol in the amount of precipitation on dilution and on mixing, and in the character of the precipitates, these being more soluble, and containing less resin and fat and probably less of the active principle. In administration there are similar slight advantages over alcohol in that the dilutions with water at the moment of taking the doses are less muddy and unsightly, whilst the acidulous taste is less disagreeable.

From these considerations and from all that is as yet known, it is claimed that there are no serious therapeutical nor administrative objections to a more extended and more general trial of this proposed substitution, especially by the pharmacopœial authorities through the Research Committees.

The chief, though possibly not the only reason for a careful consideration of this proposed substitution is economy in the use of alcohol by the use of a cheaper solvent. The Alcohol of the U. S. Pharmacopœia, 91 p.c. by weight, costs about \$2.40 per gallon of 6 pounds 13 + ounces avoirdupois, or, say, 35 + cents per avoirdupois pound—or, say, 77 + cents per 1000 Gm.

The Acetic Acid of the U. S. P., 36 p.c., costs about 10 cents per pound, or 22 cents per 1000 Gm. When diluted to a strength of 10 p.c., which is the strength most frequently required as a menstruum, the cost is less than 3 cents per pound, as against 18 cents per pound for the Diluted Alcohol of the U. S. P., with which this 10 p.c. acid corresponds—the alcoholic menstrua costing six times as much as the acid menstrua to accomplish the same extraction.

In order to measure with a fair degree of accuracy the comparative capacity of alcohol and acetic acid for extracting the active principles of drugs, it was proposed to make parallel extractions of the same drug under the same conditions at the same time. In selecting a drug for the first trial, that is most difficult to extract to complete exhaustion, *nux vomica* was taken. For the extraction of this important drug the U. S. P. has an excellent formula and process by which the seed is reduced to a powder that passes through a No. 60 sieve—60 meshes to the linear inch—and is percolated to practical exhaustion with a menstruum of about 64.5 p.c. alcohol, to the first part of which a small proportion of acetic acid is added. That

is, 500 Gm. of No. 60 powder is moistened with 500 Cc. of the alcohol to which 25 Cc. of 36 p.c. acetic acid has been previously added, and it is then percolated to exhaustion with the alcohol without further addition of acetic acid. This powder and menstruum were used on one series of percolations in competition with a 10 p.c. acetic acid on a very coarse powder in a corresponding series of percolations. The weight of 100 Cc. at about 23°C. of the U. S. P. menstruum with acetic acid was 88.70 Gm.—without the acid 88.00 Gm., and the same volume of the acetic acid menstruum at the same temperature weighed 101.43 Gm. The percolates were received in 100 Cc. fractions in narrow-neck flasks, and weighed at about this temperature, and the weights of the menstrua subtracted from the weights of the percolates gave the series of differences that are shown in the table to indicate the rates of exhaustion.

About 10 kilogrammes of good, well-seasoned *nux vomica* was taken from a lot of 2,300 pounds and very coarsely ground so that all of it was passed through a No. 9 sieve. Then half of this was powdered and all passed through a No. 60 sieve for the U. S. P. percolations, thus making sure that the fine and coarse were as nearly alike as practicable. Then each portion, fine and coarse, was carefully assayed, the powder giving 2.80 p.c. of mixed alkaloids, and the ground giving 2.93 p.c. of mixed alkaloids; and therefore 1500 Gm. of the powder would contain 42.00 Gm. of alkaloids and the same quantity of ground would contain 43.95 Gm. of mixed alkaloids, to be washed out by the different menstrua.

The process of Reperculation* was used for the extractions, and syphon percolators—and these were so managed that the mass of solid contents was kept entirely filled with the menstruum as indicated by a stratum of menstruum on top of the mass and the percolate rising in the well-tube to near the level of the menstruum on top. This mass in saturation was allowed to stand covered for 48 hours when the syphon was put in place and started, being held so high as to draw only from the upper part of the well-tube, and at a rate of dropping so slow as to yield two to three fractions of 100 Cc. each in the 24 hours.

*This process of Reperculation originated with the writer thirty odd years ago, see Proceedings of the Amer. Pharm. Asso., for 1866, p. 85, and was elaborated through a series of papers on economizing the use of alcohol in extracting drugs, published through several years' Proceedings for 1865, p. 201; 1867, p. 391; 1870, p. 166; 1872, p. 182. This last paper is a note on a new form of percolator, and in it the syphon percolator now used for so many years, is first described and figured. The final paper of this series is in Proceedings for 1873, p. 548.

If this dropping could be so slow that its rate when multiplied into the whole mass would reduce the downward flow of the liquid between the solid particles to the same rate of downward flow as that which passed through the particles, then the percolation would be ideal, and one stratum of menstruum would pass downward as a piston, and the exhaustion would be complete with the smallest quantity of solvent that could hold all the soluble matters. This principle, underlying all percolation, being kept in mind, the rate was kept slow, and to control loss by evaporation the outer, turned up end of the syphon was kept well within the flask receiving the fraction of percolate.

Three portions of 500 Gm. each of each powder—fine and coarse—were taken for the repercolation and parallel percolations were carried along together, the fine U. S. P. powder with the U. S. P. alcoholic menstruum, and the coarse with the acetic acid menstruum. The percolates were received in long-necked 100 Cc. flasks re-marked for that capacity at 23°C. Each fraction as received was adjusted to the mark and weighed, the weighing being done to the nearest centigramme, and the measuring to the nearest tenth of a cubic centimetre.

From the weight of each 100 Cc. fraction the weight of the menstruum was subtracted and the difference noted. These differences make up the following table, which shows approximately the rate of exhaustion as each fraction was received.

The first portion of 500 Gm. of U. S. P. fine powder was moistened with the U. S. P. proportion, or 500 Cc. of 64.5 p.c. alcohol, to which 25 Cc. of 36 p.c. acetic acid had been previously added, and macerated for 48 hours in a closely covered vessel. It was then packed in a syphon percolator and 600 Cc. of the 64.5 p.c. alcohol, without acetic acid, was poured on top in successive portions of about 100 Cc. each until a stratum remained permanent on top, and the percolate in the central well-tube stood nearly up to the level of the stratum of menstruum on top. In this condition it was closely covered and allowed to digest for 24 hours. Then the syphon was put in place, started and adjusted so high as to control the rate of dropping to an average of about 3 to 4 drops per minute during the day, and very much slower, or at rest, during the night, when the columns in the syphon legs reached a balance, as no more menstruum was poured on top during the night.

The 1st five fractions after having been separately weighed were added together in a 500 Cc. flask re-marked for 23°C., and the few

drops needed to make up the measure were added from the sixth fraction.

Then 10 Cc. of this 500 was carefully measured off into a 12 Cm. flat bottom, tared capsule, and evaporated on a water-bath until it nearly ceased to lose weight. The weight of this extract multiplied by 50 was accepted as the total extract contained in the 500 Cc. of percolate.

The 2d five fractions of percolate were weighed, the differences taken, and they were then added together and made up to 500 Cc., as before, and then 25 Cc. of 36 p.c. acetic acid having been added, the 525 Cc. was used to moisten the second portion of 500 Gm. of fine U. S. P. powder. This was then digested, packed and percolated as the first portion, and the fractions of weak percolate from the first portion first, and fresh menstruum afterwards, were poured on top until the exhaustion was complete, as judged by the weight and taste of the fractions. The fractions of this second portion were managed exactly as those from the first portion, and 10 Cc. of the 500 evaporated to dryness for proportion of extract in the same way, and the capsule and extract were reserved for assay.

The 2d five fractions of the second portion were put together, made up to 500 Cc., 25 Cc. of 36 p.c. acetic acid added, and the whole 525 Cc. used to moisten the third and final portion of 500 Gm. of U. S. P. fine powder. Then this final third portion was percolated exactly as was the second portion, the fractions of weak percolate from the second being put upon the third, and then fresh menstruum to exhaustion. As the repercolation was not to be carried farther in this instance, there was no present use for the fractions of weak percolate coming from this third portion, except to show the extent and rate of exhaustion—the exhaustion being found to be practically, though not quite, complete after the seventeenth fraction, as judged by the bitterness of the residue and the assays when the percolation was carried on to the twentieth fraction. The 1st five fractions of this third portion were put together and made up to 500 Cc. as in the other portions, and, by assay, this 500 Cc. was found to represent the 500 Gm. of fine powder in the proportions of Cc. for Gm. The 2d and 3d five fractions of this third portion were made up to 500 Cc. each and were weighed and assayed for extracts and for alkaloids; and, finally, the seventeenth fraction was also assayed, thus finishing the series managed by the excellent process of the U. S. P. with the alcoholic menstruum, and with such results the principal reasons for substituting acetic acid for alcohol are economy in cost and easier and better exhaustion.

The parallel repercolations to be compared with this U. S. P. process as a standard, were managed exactly in the same way, at the same time, with only the difference that the 1500 Gm. of the same nux vomica was very coarsely ground, and 10 p.c. acetic acid was used as a menstruum instead of the U. S. P. alcohol. The very coarse grinding not only saves much labor, but is essential to the success of the acid menstruum, since with a fine powder the mass is liable to form a mud-like mixture that is not percolable. With this difference only, the description of the U. S. P. process applies equally to that with the acetic acid menstruum, and the following table gives the differences in weight for each 100 Cc. fraction, between the weight of 100 Cc. of menstruum and 100 Cc. of percolate. The weight of 100 Cc. of that part of the U. S. P. menstruum that contained the acetic acid was 88.70 Gm. An equal volume of the alcohol menstruum without acetic acid was 88.00 Gm. The weight of 100 Cc. of the 10 p.c. acetic acid menstruum was 101.43 Gm. These weights added to the differences of the table give the weights of the fractions of percolate.

RATE AND DEGREE OF EXHAUSTION BY DIFFERENCES.

PERCOLATE.	FIRST PORTION.		SECOND PORTION.		THIRD PORTION.	
	U. S. P. Differ- ences. Gm.	Acetic Acid. Differ- ences. Gm.	U. S. P. Differ- ences. Gm.	Acetic Acid. Differ- ences. Gm.	U. S. P. Differ- ences. Gm.	Acetic Acid. Differ- ences. Gm.
1st Fraction.....	3.34	6.03	3.69	7.16	5.89	7.42
2d ".....	3.66	5.77	4.48	7.26	6.07	7.68
3d ".....	3.22	5.01	4.53	6.48	5.70	6.69
4th ".....	2.69	4.42	4.46	6.03	5.54	5.71
5th ".....	2.09	3.47	3.91	4.83	4.78	5.37
6th ".....	2.23	2.84	4.29	4.22	4.72	4.86
7th ".....	1.79	2.17	3.19	2.91	3.50	4.26
8th ".....	1.33	1.95	2.40	2.02	3.06	3.00
9th ".....	1.17	1.21	1.57	1.44	2.33	1.97
10th ".....	1.12	.85	1.43	1.18	1.89	1.52
11th ".....	.77	.72	.94	.74	1.69	1.02
12th ".....	.51	.40	.94	.72	1.52	.86
13th ".....	.37	.06	.70	.53	1.16	.62
14th ".....	.27	.18	.84	.37	1.00	.72
15th ".....	.15	.09	.36	.33	.79	.33
16th ".....	.19	.13	.33	.26	.76	.43
17th ".....	.11	.05	.34	.29	.65	.27
18th ".....			.26	.14	.61	.32
19th ".....			.18	.00	.47	.11
20th ".....					.33	.06

The next table deals with the percolates in groups of five fractions each, the measure being made up to 500 Cc. as described above, and these larger fractions were assayed for measure and weight of fraction—for total extract—for chloroform extract and for total of mixed alkaloids.

The most significant showing of this table, and the most important to the proposed substitution, is, that in the first three lines of the table the alcoholic menstruum has extracted 85.3 p.c. of the total alkaloids present, while the acetic acid menstruum has extracted 89.8 p.c. And that in the fifth line the amount of alkaloids not extracted is as 91 for the U. S. P. menstruum against 27 for the acetic acid menstruum.

Then, as a broad general result, it is claimed to have been shown that by the substitution of the acetic acid menstruum for the alcoholic, one-half the cost of grinding, and five-sixths of the cost of menstruum are saved, an equivalent product being obtained in larger quantity.

NUX VOMICA REPERCOLATIONS.

Three Successive Portions of 500 Gm. each for each Menstruum.

500 Gm. PORTIONS.	500 Cc. PERCO- LATES.	U. S. P. MENSTRUUM. 64.5 p.c. Alcohol with a small proportion of Acetic Acid.				ACETIC ACID MENSTRUUM. 10 p.c. Acetic Acid.			
		Weight Gm.	Ex- tract. Gm.	Chlo- roform Ext'ct. Gm.	Alka- loids. Gm.	Weight Gm.	Ex- tract. Gm.	Chlo- roform Ext'ct. Gm.	Alka- loids. Gm.
1st Portion	1st 500 Cc.	457.76	54.80	15.50	10.56	551.20	78.00	12.00	11.19
2d "	1st 500 Cc.	463.88	60.00	17.50	12.01	538.10	104.00	16.00	13.74
3d "	1st 500 Cc.	471.05	72.50	20.00	14.74	539.69	104.80	21.00	14.65
" "	2d 500 Cc.	454.38	30.50	9.50	5.46	521.80	51.50	9.50	4.20
" "	3d 500 Cc.	443.36	2.50	1.00	0.91	508.36	4.00	0.50	0.27
" "	17th Fraction	88.65	0.40	0.16	0.07	101.70	0.48	0.08	0.06
					43.75				
					Original assays..	42.00			
									44.11
									43.95

The weighing and measurements of the first three columns of the table are actual upon the scale of the figures given. Those of the other columns were obtained as follows: 10 Cc. was accurately measured off from each 500 Cc. of percolate, and was evaporated until it practically ceased to lose weight. The weight of this extract multiplied by 50 is given in columns 4 and 8 as being the extract present in the 500 Cc. This extract from 10 Cc. was then

dissolved in ammoniated alcohol and the alkaloid shaken out with chloroform and ether mixture. The chloroform and ether were boiled off and the extract dried until it practically ceased to lose weight. This weight multiplied by 50 is given in columns 5 and 9 as being the chloroform extract in the 500 Cc. of percolate. This extract titrated with decinormal acid and alkali gave the total alkaloids in the 10 Cc. which, multiplied by 50 gave the figures of columns 6 and 10. Hence all these figures are subject to the risk of multiplication of error. But when they are compared with the actual assays of the drug percolated, they are as close as could be expected. The original assays were for the U. S. P. fine powder 2.80 p.c., or 42 Gm. in the 1500 Gm. of powder against 43.75 Gm. as footed up in the table.

For the coarsely ground drug the original assay was 2.93 p.c., or 43.95 Gm. in the 1500, against 44.11 Gm. as footed up in the table.

It will be seen by the table that the first 500 Cc. of the third 500 Gm. of both powders give a fluid extract that represents Cc. for Gm., but 100 Cc. of these will contain 2.8 Gm. of mixed alkaloids instead of 1.5 Gm. as prescribed by the U. S. P. for its Fluid Extract.

These fluid extracts are both very dark brown liquids, the alcoholic one being much the darker, and after six weeks standing it is very bright and clear, and has a very small gray deposit. That with the acid menstruum is clear and fairly bright, and without deposit. It has a very distinctly acid odor—stronger of acid than the other has of alcohol, and it contains about 8.1 p.c. of free acid. The dose of the Fluid Extract being about 0.18 Cc., or three minims, this proportion of free acid in it would not be perceptible, and would be entirely insignificant.

The tables show that the acid preparation has a much larger proportion of inert extractive matter, and this would be objectionable if it was largely precipitable on dilution. But it gives much less precipitate on dilution than the alcoholic, and that which it does give is not liable to carry down alkaloids soluble in an acid solution.

Actual experience in the use of preparations made with the new menstruum is as yet not large. Still, throughout the past two years, a steadily increasing number of fluid extracts and extracts have been made and have been confidently supplied and recommended in the veterinary profession where large doses are required, and where

diminished cost is of great importance, and where close observation of effects and results are easily made. As a result of this distribution many letters have been received from veterinary surgeons to the effect that the use has been quite successful, and that in the increasing list, now embracing all of the more important extracts and fluid extracts, no drawbacks have yet been discovered.

There has seemed to be no necessity for a new or changed name for these preparations. They are simply extracts and fluid extracts made with a new menstruum, and when they are recognized by the U. S. P., the present officinal names will doubtless remain unchanged, as it is only the menstruum that is changed, the quality and strength being undisturbed. For the present it is considered sufficient to place conspicuously on the label, under the U. S. P. title, the words "Made with acetic acid," especially as the new menstruum involves no increase of risk of serious mistakes.

It is proposed that the next paper shall investigate the very important and very difficult exhaustion of Cinchona.

THE ASSAY PROCESS.

Early in this investigation it became necessary to have a convenient and fairly accurate process of assay for the mixed alkaloids. The short and easy methods of Messrs. Dunstan and Short, given in the *British Pharm. Journ. and Trans.*, 3d Series, Vol. XIII, pp. 665-1055, and Vol. XIV, p. 621, and given in the *British Pharmacopœia*, were found objectionable on some accounts, but chiefly because the results are too high. For example, a table is given at p. 1055, wherein from seven samples the percentage of total alkaloids ranged from 3.04 to 3.90 p.c., with an average of 3.29 p.c. This, in the writer's experience, is much too high, and there is a probability that the plus error may be due to weighing the chloroform extract as alkaloids. The most recent authority noticed is the new, 1898, *British Pharmacopœia*, but its method is liable to the same objection of weighing a chloroform extract as alkaloid. The U. S. *Pharmacopœia* of 1890 has an excellent method that avoids this source of error by titrating the alkaloids. This method—U. S. P., 1890, pp. 152, *et seq.*—first makes a dry extract and then assays that for use in its standardized preparations.

Two grammes of the dry extract is dissolved by shaking in a separator with 20 Cc. of a previously-made mixture of 2 volumes of alcohol (91 p.c.), 1 volume of water of ammonia (10 p.c.), and 1

volume of water. Then 20 Cc. of chloroform (99 p.c.) is added and the mixture is agitated during five minutes. The chloroform is then allowed to separate and is drawn off as far as possible by the stopcock. This washing out is repeated with two farther portions of chloroform of 15 Cc. each. The chloroform solutions are then collected in a beaker and exposed on a water-bath until the chloroform and ammonia are completely dissipated.

Then 10 Cc. of decinormal sulphuric acid is added, stirred, diluted with 20 Cc. of hot water, and when solution is complete 2 Cc. of brazilwood indicator is added. Centinormal potassium hydrate is added until a permanent pinkish color is produced. The number of Cc. of potassium hydrate required is divided by 10, the number found is subtracted from 10, and the remainder is multiplied by 0.0364, and that product by 50, which will give the percentage of total alkloids in the 2 Gm. of extract taken, it being assumed that strychnine and brucine are present in equal proportion, and the above factor being found by taking the mean of their respective molecular weights ($334+394\div2=364$).

This very-well designed method was found impracticable in the writer's hands, through difficulty in carrying out the details. The first obstruction encountered was the very nearly constant emulsifying of the chloroform and the consequent refusal of the liquids to separate on standing, and the difficulty and loss of time in managing an emulsion once formed. The U. S. P. directs the immiscible liquids to be "agitated," not shaken; yet if shaking be avoided and the agitation be ever so cautiously managed some emulsion seems unavoidable, whilst a degree and kind of agitation that is short of shaking washes out the alkaloids imperfectly. Emulsions that did form were best managed by running them out into a capsule, driving off the chloroform on a water-bath, returning the dark liquid to the separator, and managing the next chloroform with greater care. But a better expedient was found in a recommendation of A. H. Allen and others, to use a mixture of equal volumes of chloroform (99 p.c.) and ether (96 p.c.). With this mixture, used in large quantity, vigorous shaking and consequent effective washing may be employed with little emulsion, if any, at the last of the washings, the separations being very prompt and sharp, usually ready to draw off within half an hour after shaking. The clear chloroform and ether solutions are better managed if drawn off into and boiled off from a flask, as the dissolving, the heating up and the titration are more easily done in a flask. The solution to be titrated

is always of a full yellow color, from a bright pale yellow to a deep yellow, with a reddish tint by reflected light, a color in which the first increase of pinkish tint is difficult to detect, and the want of sharpness and decision in this end reaction is the persisting difficulty with all methods of titration that were tried, but in comparing indicators brazilwood was found to be inferior to logwood. A decinormal potassium hydrate is preferable to centinormal, as it does not dilute the solution of alkaloids so much, while in accuracy of reading it is far within the limit of error of the indicator.

Chiefly in consideration of these conditions the following method was reached and used :

A fair sample of *nux vomica* is drawn and an average dozen or so of the seed is so milled as to pass through a No. 9 sieve. Of this 10 Gm. is weighed off and exhausted with 10 p.c. acetic acid. This exhaustion is easily and conveniently done in a Soxhlet apparatus, but so large an amount of extractive is washed out by the warm acid, that the extract is very difficult to dry, and afterwards at once forms an emulsion that is difficult and tedious to manage. Cold percolation to complete exhaustion gives a much better result, and is not difficult to effect, provided the powder be moistened for packing with not more than 10 Cc. of the acetic acid, and be not packed too tightly.

The percolate is evaporated to dryness on a water-bath, in a large (12 Cm.) flat-bottom capsule, so that the extract is in a thin layer, easy to dry and easy to dissolve. The weight gives the yield of extract.

If a fluid extract or tincture is to be assayed, it is measured, weighed and dried in the same way.

A mixture is made of 2 volumes of alcohol (91 p.c.), 1 volume of water of ammonia (10 p.c.), and 1 volume of water, and of this, 10 Cc. is poured upon the dry extract in the capsule. Then by patiently moving a stirrer over the smooth surface of the dry extract for a quarter of an hour or more, a smooth solution of the extract, easy to wash, is obtained. This is poured into a separator of 150 Cc. capacity, and the capsule and stirrer are rinsed clean with 10 Cc. more of the alcohol and ammonia solution.

A mixture is made of equal volumes of chloroform (99 p.c.) and ether (96 p.c.), and 40 Cc. of this is added to the liquid in the separator, and the whole is shaken vigorously during five minutes, and then allowed to separate. In twenty to thirty minutes the separation will be complete to a sharp line, when the depth of the upper,

dark stratum should be observed and measured. The chloroform-ether solution is then drawn off into a tared flask of about 100 Cc. capacity, and the flask is immersed in a hot water bath so that the chloroform-ether may be boiled off by the time another washing is ready. In the meantime 40 Cc. more of chloroform-ether has been added to the contents of the separator, and the shaking, separating and drawing off into the flask repeated. This second washing may or may not be then followed by a third, managed in the same way, if required.

If after standing, to separate completely a second time, the dark liquid on top shall be found to have increased in depth, the indication is that emulsion has been formed to that extent, and that the chloroform forming that emulsion holds the proportion of alkaloids present in solution at the time that emulsion was formed, and as the chloroform cannot be washed out of an emulsion, so the alkaloids held by that chloroform cannot be washed out. Therefore, in the case of any considerable amount of emulsion after the chloroform-ether solution is drawn off into the flask, the dark liquid is drawn off into the flat capsule and warmed on a water-bath until all the chloroform-ether is driven off. The dark liquid is then returned to the separator and again washed as before. If a small amount of emulsion again forms, as very rarely occurs, the chloroform in it holds so very little alkaloid as to be within the limit of error of the method.

The tared flask will then contain the total chloroform extract, and the weight of this was long erroneously accepted as the weight of alkaloids.

Then 10 Cc. of decinormal sulphuric acid is carefully measured from a burette into the flask, and is rinsed round and warmed by immersion in a water-bath until the soluble alkaloids are dissolved, when the insoluble residue will show how much of this extract is not alkaloid.

Then 20 Cc. of hot water is added to the contents of the flask, and a definite quantity (10 drops) of logwood indicator. The color is then closely observed by transmitted light, and matched by a similar quantity of liquid in a similar flask. Decinormal potassium hydrate is now dropped in from a burette until the color changes slightly to a pinkish tint or shade of the original yellow by transmitted light, and when this hardly perceptible change is now looked at by reflected light the pink tint is very distinct.

The number of Cc. required subtracted from 10 (Cc. of acid used) gives the number of Cc. of acid saturated by alkaloids, and this

number multiplied by the mean of the molecular weights of the two alkaloids ($0.0334 + 0.0394 \div 2 =$) 0.0364, gives the amount of alkaloids obtained from the 10 Gm. of *nux vomica*, the strychnine and brucine being assumed to be present in equal proportions.

Then as 10 is to the product from 10, so is 100 to the percentage of the mixed alkaloids.

NOTE.

The first paper of this number of the *Ephemeris* is simply a reprint of the last paper of the January number, and it is reproduced here for the purpose of bringing it into closer relation with the present second paper on the same subject and thus allowing two drugs of difficult management to be more closely compared.

But the rate of progress made in these two papers has been so slow as to make any general consideration of the Fluid Extracts and Extracts of the *Pharmacopœia* on the same plan, by the present writer, almost hopeless.

Enough may have been done to show the importance of the subject, and now it is hoped that one or more of the Research Committees of the *Pharmacopœia* may take up the subject and pursue it in view of the near approach of the Revision of 1900.

In the meantime experience in the use of the new menstruum and in the use of fluid extracts and extracts made with acetic acid is increasing quite rapidly.

The alkaloidal fluid extracts all seem successful both in modes of preparation and uses. Aconite, belladonna, colchicum, conium, hyoscyamus, ipecac, and nux vomica seem to be leaders in this group. Of the glucocidal fluid extracts cascara, digitalis, ergot, sarsaparilla, squill, and valerian seem to take the lead, and it is rare to get a more serious complaint than that of the smell of acetic acid.

July, 1899.

E. R. SQUIBB.

ON ACETIC ACID AS A SUBSTITUTE FOR ETHYL ALCOHOL IN EXTRACTING THE ACTIVE PRINCIPLES OF SOME OFFICINAL DRUGS.

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(FIRST PAPER.)

In the proposed substitution of acetic acid for alcohol as a menstruum for extracting and a vehicle for preserving and administering the active principles of drugs used in medicine, the very first question is as to the therapeutic equivalency. That is, if the presence of the necessary amount of acetic acid in fluid extracts, etc., can be shown to be therapeutically objectionable, or more objectionable than the necessary amount of alcohol, then it is not proper to make the substitutions.

But acetic acid has long been used for the extraction of cantharides, colchicum, ipecacuanha, opium, squill, etc., without developing any known therapeutical objections, and in a limited experience in the extraction of spices, and of some drugs for veterinary use, it gives extracts practically identical with those from alcohol. The acid has a universally accepted food value, not only as a hydrocarbon, but as a mild acidulous aid in the primary processes of digestion, but in the small quantities that would be present in the doses of fluid extracts, it would be practically inert, or at least as nearly inert as the alcohol which it would replace.

Its properties and value as an antiseptic, detergent and preservative are well known, but whether it would be present in sufficient proportion to preserve such preparations from change during a long time has not yet been determined. The oldest set of samples, made with 10 p.c. acid, are now about two years old and apparently unchanged. Fluid Extract of Ergot, by the officinal process, is preserved by acetic acid in small proportion, as first proposed and used by Prof. Wm. Proctor, Jr., in 1857, and in that case an alcoholic preparation very liable to change has been made permanent.

*This paper must be credited to the *American Journal of Pharmacy*, as it was first published in that journal, Vol. 71, No. 1, p. 1, 1899.

Fluid extracts made with acetic acid menstrua are much more loaded with inert extractive matter than when made with alcohol; and this is a disadvantage, but hardly hurtful, nor more than an inconvenience occasionally.

In compounding prescriptions the acetic acid menstruum has a slight general advantage over alcohol in the amount of precipitation on dilution and on mixing, and in the character of the precipitates, these being more soluble, and containing less resin and fat and probably less of the active principle. In administration there are similar slight advantages over alcohol in that the dilutions with water at the moment of taking the doses are less muddy and unsightly, whilst the acidulous taste is less disagreeable.

From these considerations and from all that is as yet known, it is claimed that there are no serious therapeutical nor administrative objections to a more extended and more general trial of this proposed substitution, especially by the pharmacopœial authorities through the Research Committees.

The chief, though possibly not the only reason for a careful consideration of this proposed substitution is economy in the use of alcohol by the use of a cheaper solvent. The Alcohol of the U. S. Pharmacopœia, 91 p.c. by weight, costs about \$2.40 per gallon of 6 pounds 13 + ounces avoirdupois, or, say, 35 + cents per avoirdupois pound—or, say, 77 + cents per 1000 Gm.

The Acetic Acid of the U. S. P., 36 p.c., costs about 10 cents per pound, or 22 cents per 1000 Gm. When diluted to a strength of 10 p.c., which is the strength most frequently required as a menstruum, the cost is less than 3 cents per pound, as against 18 cents per pound for the Diluted Alcohol of the U. S. P., with which this 10 p.c. acid corresponds—the alcoholic menstrua costing six times as much as the acid menstrua to accomplish the same extraction.

In order to measure with a fair degree of accuracy the comparative capacity of alcohol and acetic acid for extracting the active principles of drugs, it was proposed to make parallel extractions of the same drug under the same conditions at the same time. In selecting a drug for the first trial, that is most difficult to extract to complete exhaustion, *nux vomica* was taken. For the extraction of this important drug the U. S. P. has an excellent formula and process by which the seed is reduced to a powder that passes through a No. 60 sieve—60 meshes to the linear inch—and is percolated to practical exhaustion with a menstruum of about 64.5 p.c. alcohol, to the first part of which a small proportion of acetic acid is added. That

is, 500 Gm. of No. 60 powder is moistened with 500 Cc. of the alcohol to which 25 Cc. of 36 p.c. acetic acid has been previously added, and it is then percolated to exhaustion with the alcohol without further addition of acetic acid. This powder and menstruum were used on one series of percolations in competition with a 10 p.c. acetic acid on a very coarse powder in a corresponding series of percolations. The weight of 100 Cc. at about 23°C. of the U. S. P. menstruum with acetic acid was 88.70 Gm.—without the acid 88.00 Gm., and the same volume of the acetic acid menstruum at the same temperature weighed 101.43 Gm. The percolates were received in 100 Cc. fractions in narrow-neck flasks, and weighed at about this temperature, and the weights of the menstrua subtracted from the weights of the percolates gave the series of differences that are shown in the table to indicate the rates of exhaustion.

About 10 kilogrammes of good, well-seasoned *nux vomica* was taken from a lot of 2,300 pounds and very coarsely ground so that all of it was passed through a No. 9 sieve. Then half of this was powdered and all passed through a No. 60 sieve for the U. S. P. percolations, thus making sure that the fine and coarse were as nearly alike as practicable. Then each portion, fine and coarse, was carefully assayed, the powder giving 2.80 p.c. of mixed alkaloids, and the ground giving 2.93 p.c. of mixed alkaloids; and therefore 1500 Gm. of the powder would contain 42.00 Gm. of alkaloids and the same quantity of ground would contain 43.95 Gm. of mixed alkaloids, to be washed out by the different menstrua.

The process of Repercolation* was used for the extractions, and syphon percolators—and these were so managed that the mass of solid contents was kept entirely filled with the menstruum as indicated by a stratum of menstruum on top of the mass and the percolate rising in the well-tube to near the level of the menstruum on top. This mass in saturation was allowed to stand covered for 48 hours when the syphon was put in place and started, being held so high as to draw only from the upper part of the well-tube, and at a rate of dropping so slow as to yield two to three fractions of 100 Cc. each in the 24 hours.

*This process of Repercolation originated with the writer thirty odd years ago, see Proceedings of the Amer. Pharm. Asso., for 1866, p. 85, and was elaborated through a series of papers on economizing the use of alcohol in extracting drugs, published through several years' Proceedings for 1865, p. 201; 1867, p. 391; 1870, p. 166; 1872, p. 182. This last paper is a note on a new form of percolator, and in it the syphon percolator now used for so many years, is first described and figured. The final paper of this series is in Proceedings for 1873, p. 548.

If this dropping could be so slow that its rate when multiplied into the whole mass would reduce the downward flow of the liquid between the solid particles to the same rate of downward flow as that which passed through the particles, then the percolation would be ideal, and one stratum of menstruum would pass downward as a piston, and the exhaustion would be complete with the smallest quantity of solvent that could hold all the soluble matters. This principle, underlying all percolation, being kept in mind, the rate was kept slow, and to control loss by evaporation the outer, turned up end of the syphon was kept well within the flask receiving the fraction of percolate.

Three portions of 500 Gm. each of each powder—fine and coarse—were taken for the repercolation and parallel percolations were carried along together, the fine U. S. P. powder with the U. S. P. alcoholic menstruum, and the coarse with the acetic acid menstruum. The percolates were received in long-necked 100 Cc. flasks re-marked for that capacity at 23°C. Each fraction as received was adjusted to the mark and weighed, the weighing being done to the nearest centigramme, and the measuring to the nearest tenth of a cubic centimetre.

From the weight of each 100 Cc. fraction the weight of the menstruum was subtracted and the difference noted. These differences make up the following table, which shows approximately the rate of exhaustion as each fraction was received.

The first portion of 500 Gm. of U. S. P. fine powder was moistened with the U. S. P. proportion, or 500 Cc. of 64.5 p.c. alcohol, to which 25 Cc. of 36 p.c. acetic acid had been previously added, and macerated for 48 hours in a closely covered vessel. It was then packed in a syphon percolator and 600 Cc. of the 64.5 p.c. alcohol, without acetic acid, was poured on top in successive portions of about 100 Cc. each until a stratum remained permanent on top, and the percolate in the central well-tube stood nearly up to the level of the stratum of menstruum on top. In this condition it was closely covered and allowed to digest for 24 hours. Then the syphon was put in place, started and adjusted so high as to control the rate of dropping to an average of about 3 to 4 drops per minute during the day, and very much slower, or at rest, during the night, when the columns in the syphon legs reached a balance, as no more menstruum was poured on top during the night.

The 1st five fractions after having been separately weighed were added together in a 500 Cc. flask re-marked for 23°C., and the few

drops needed to make up the measure were added from the sixth fraction.

Then 10 Cc. of this 500 was carefully measured off into a 12 Cm. flat bottom, tared capsule, and evaporated on a water-bath until it nearly ceased to lose weight. The weight of this extract multiplied by 50 was accepted as the total extract contained in the 500 Cc. of percolate.

The 2d five fractions of percolate were weighed, the differences taken, and they were then added together and made up to 500 Cc., as before, and then 25 Cc. of 36 p.c. acetic acid having been added, the 525 Cc. was used to moisten the second portion of 500 Gm. of fine U. S. P. powder. This was then digested, packed and percolated as the first portion, and the fractions of weak percolate from the first portion first, and fresh menstruum afterwards, were poured on top until the exhaustion was complete, as judged by the weight and taste of the fractions. The fractions of this second portion were managed exactly as those from the first portion, and 10 Cc. of the 500 evaporated to dryness for proportion of extract in the same way, and the capsule and extract were reserved for assay.

The 2d five fractions of the second portion were put together, made up to 500 Cc., 25 Cc. of 36 p.c. acetic acid added, and the whole 525 Cc. used to moisten the third and final portion of 500 Gm. of U. S. P. fine powder. Then this final third portion was percolated exactly as was the second portion, the fractions of weak percolate from the second being put upon the third, and then fresh menstruum to exhaustion. As the reperecolation was not to be carried farther in this instance, there was no present use for the fractions of weak percolate coming from this third portion, except to show the extent and rate of exhaustion—the exhaustion being found to be practically, though not quite, complete after the seventeenth fraction, as judged by the bitterness of the residue and the assays when the percolation was carried on to the twentieth fraction. The 1st five fractions of this third portion were put together and made up to 500 Cc. as in the other portions, and, by assay, this 500 Cc. was found to represent the 500 Gm. of fine powder in the proportions of Cc. for Gm. The 2d and 3d five fractions of this third portion were made up to 500 Cc. each and were weighed and assayed for extracts and for alkaloids; and, finally, the seventeenth fraction was also assayed, thus finishing the series managed by the excellent process of the U. S. P. with the alcoholic menstruum, and with such results the principal reasons for substituting acetic acid for alcohol are economy in cost and easier and better exhaustion.

The parallel repercolations to be compared with this U. S. P. process as a standard, were managed exactly in the same way, at the same time, with only the difference that the 1500 Gm. of the same nux vomica was very coarsely ground, and 10 p.c. acetic acid was used as a menstruum instead of the U. S. P. alcohol. The very coarse grinding not only saves much labor, but is essential to the success of the acid menstruum, since with a fine powder the mass is liable to form a mud-like mixture that is not percolable. With this difference only, the description of the U. S. P. process applies equally to that with the acetic acid menstruum, and the following table gives the differences in weight for each 100 Cc. fraction, between the weight of 100 Cc. of menstruum and 100 Cc. of percolate. The weight of 100 Cc. of that part of the U. S. P. menstruum that contained the acetic acid was 88.70 Gm. An equal volume of the alcohol menstruum without acetic acid was 88.00 Gm. The weight of 100 Cc. of the 10 p.c. acetic acid menstruum was 101.43 Gm. These weights added to the differences of the table give the weights of the fractions of percolate.

RATE AND DEGREE OF EXHAUSTION BY DIFFERENCES.

PERCOLATE.	FIRST PORTION.		SECOND PORTION.		THIRD PORTION.	
	U. S. P. Differ- ences. Gm.	Acetic Acid. Differ- ences. Gm.	U. S. P. Differ- ences. Gm.	Acetic Acid. Differ- ences. Gm.	U. S. P. Differ- ences. Gm.	Acetic Acid. Differ- ences. Gm.
1st Fraction.....	3.34	6.03	3.69	7.16	5.89	7.42
2d " 	3.66	5.77	4.48	7.26	6.07	7.68
3d " 	3.22	5.01	4.53	6.48	5.70	6.69
4th " 	2.69	4.42	4.46	6.03	5.54	5.71
5th " 	2.09	3.47	3.91	4.83	4.78	5.37
6th " 	2.23	2.84	4.29	4.22	4.72	4.86
7th " 	1.79	2.17	3.19	2.91	3.50	4.26
8th " 	1.33	1.95	2.40	2.02	3.06	3.00
9th " 	1.17	1.21	1.57	1.44	2.33	1.97
10th " 	1.12	.85	1.43	1.18	1.89	1.52
11th " .....	.77	.72	.94	.74	1.69	1.02
12th " .....	.51	.40	.94	.72	1.52	.86
13th " .....	.37	.06	.70	.53	1.16	.62
14th " .....	.27	.18	.84	.37	1.00	.72
15th " .....	.15	.09	.36	.33	.79	.33
16th " .....	.19	.13	.33	.26	.76	.43
17th " .....	.11	.05	.34	.29	.65	.27
18th " .....			.26	.14	.61	.32
19th " .....			.18	.00	.47	.11
20th " .....					.33	.06

The next table deals with the percolates in groups of five fractions each, the measure being made up to 500 Cc. as described above, and these larger fractions were assayed for measure and weight of fraction—for total extract—for chloroform extract and for total of mixed alkaloids.

The most significant showing of this table, and the most important to the proposed substitution, is, that in the first three lines of the table the alcoholic menstruum has extracted 85.3 p.c. of the total alkaloids present, while the acetic acid menstruum has extracted 89.8 p.c. And that in the fifth line the amount of alkaloids not extracted is as 91 for the U. S. P. menstruum against 27 for the acetic acid menstruum.

Then, as a broad general result, it is claimed to have been shown that by the substitution of the acetic acid menstruum for the alcoholic, one-half the cost of grinding, and five-sixths of the cost of menstruum are saved, an equivalent product being obtained in larger quantity.

NUX VOMICA REPERCOLATIONS.

Three Successive Portions of 500 Gm. each for each Menstruum.

500 Gm. PORTIONS.	500 Cc. PERCO- LATES.	U. S. P. MENSTRUUM. 64.5 p.c. Alcohol with a small proportion of Acetic Acid.				ACETIC ACID MENSTRUUM. 10 p.c. Acetic Acid.			
		Weight Gm.	Ex- tract. Gm.	Chlo- roform Ext'ct. Gm.	Alka- loids. Gm.	Weight Gm.	Ex- tract. Gm.	Chlo- roform Ext'ct Gm.	Alka- loids. Gm.
1st Portion	1st 500 Cc.	457.76	54.80	15.50	10.56	551.20	78.00	12.00	11.19
2d "	1st 500 Cc.	463.88	60.00	17.50	12.01	538.10	104.00	16.00	13.74
3d "	1st 500 Cc.	471.05	72.50	20.00	14.74	539.69	104.80	21.00	14.65
" "	2d 500 Cc.	454.38	30.50	9.50	5.46	521.80	51.50	9.50	4.20
" "	3d 500 Cc.	443.36	2.50	1.00	0.91	508.36	4.00	0.50	0.27
" "	17th Fraction	88.65	0.40	0.16	0.07	101.70	0.48	0.08	0.06
					43.75				
					Original assays..	42.00			
									44.11
									43.95

The weighing and measurements of the first three columns of the table are actual upon the scale of the figures given. Those of the other columns were obtained as follows: 10 Cc. was accurately measured off from each 500 Cc. of percolate, and was evaporated until it practically ceased to lose weight. The weight of this extract multiplied by 50 is given in columns 4 and 8 as being the extract present in the 500 Cc. This extract from 10 Cc. was then

dissolved in ammoniated alcohol and the alkaloid shaken out with chloroform and ether mixture. The chloroform and ether were boiled off and the extract dried until it practically ceased to lose weight. This weight multiplied by 50 is given in columns 5 and 9 as being the chloroform extract in the 500 Cc. of percolate. This extract titrated with decinormal acid and alkali gave the total alkaloids in the 10 Cc. which, multiplied by 50 gave the figures of columns 6 and 10. Hence all these figures are subject to the risk of multiplication of error. But when they are compared with the actual assays of the drug percolated, they are as close as could be expected. The original assays were for the U. S. P. fine powder 2.80 p.c., or 42 Gm. in the 1500 Gm. of powder against 43.75 Gm. as footed up in the table.

For the coarsely ground drug the original assay was 2.93 p.c., or 43.95 Gm. in the 1500, against 44.11 Gm. as footed up in the table.

It will be seen by the table that the first 500 Cc. of the third 500 Gm. of both powders give a fluid extract that represents Cc. for Gm., but 100 Cc. of these will contain 2.8 Gm. of mixed alkaloids instead of 1.5 Gm. as prescribed by the U. S. P. for its Fluid Extract.

These fluid extracts are both very dark brown liquids, the alcoholic one being much the darker, and after six weeks standing it is very bright and clear, and has a very small gray deposit. That with the acid menstruum is clear and fairly bright, and without deposit. It has a very distinctly acid odor—stronger of acid than the other has of alcohol, and it contains about 8.1 p.c. of free acid. The dose of the Fluid Extract being about 0.18 Cc., or three minims, this proportion of free acid in it would not be perceptible, and would be entirely insignificant.

The tables show that the acid preparation has a much larger proportion of inert extractive matter, and this would be objectionable if it was largely precipitable on dilution. But it gives much less precipitate on dilution than the alcoholic, and that which it does give is not liable to carry down alkaloids soluble in an acid solution.

Actual experience in the use of preparations made with the new menstruum is as yet not large. Still, throughout the past two years, a steadily increasing number of fluid extracts and extracts have been made and have been confidently supplied and recommended in the veterinary profession where large doses are required, and where

diminished cost is of great importance, and where close observation of effects and results are easily made. As a result of this distribution many letters have been received from veterinary surgeons to the effect that the use has been quite successful, and that in the increasing list, now embracing all of the more important extracts and fluid extracts, no drawbacks have yet been discovered.

There has seemed to be no necessity for a new or changed name for these preparations. They are simply extracts and fluid extracts made with a new menstruum, and when they are recognized by the U. S. P., the present officinal names will doubtless remain unchanged, as it is only the menstruum that is changed, the quality and strength being undisturbed. For the present it is considered sufficient to place conspicuously on the label, under the U. S. P. title, the words "Made with acetic acid," especially as the new menstruum involves no increase of risk of serious mistakes.

It is proposed that the next paper shall investigate the very important and very difficult exhaustion of Cinchona.

THE ASSAY PROCESS.

Early in this investigation it became necessary to have a convenient and fairly accurate process of assay for the mixed alkaloids. The short and easy methods of Messrs. Dunstan and Short, given in the *British Pharm. Journ. and Trans.*, 3d Series, Vol. XIII, pp. 665-1055, and Vol. XIV, p. 621, and given in the *British Pharmacopœia*, were found objectionable on some accounts, but chiefly because the results are too high. For example, a table is given at p. 1055, wherein from seven samples the percentage of total alkaloids ranged from 3.04 to 3.90 p.c., with an average of 3.29 p.c. This, in the writer's experience, is much too high, and there is a probability that the plus error may be due to weighing the chloroform extract as alkaloids. The most recent authority noticed is the new, 1898, *British Pharmacopœia*, but its method is liable to the same objection of weighing a chloroform extract as alkaloid. The U. S. *Pharmacopœia* of 1890 has an excellent method that avoids this source of error by titrating the alkaloids. This method—U. S. P., 1890, pp. 152, *et seq.*—first makes a dry extract and then assays that for use in its standardized preparations.

Two grammes of the dry extract is dissolved by shaking in a separator with 20 Cc. of a previously-made mixture of 2 volumes of alcohol (91 p.c.), 1 volume of water of ammonia (10 p.c.), and 1

volume of water. Then 20 Ce. of chloroform (99 p.e.) is added and the mixture is agitated during five minutes. The chloroform is then allowed to separate and is drawn off as far as possible by the stopcock. This washing out is repeated with two farther portions of chloroform of 15 Ce. each. The chloroform solutions are then collected in a beaker and exposed on a water-bath until the chloroform and ammonia are completely dissipated.

Then 10 Ce. of decinormal sulphuric acid is added, stirred, diluted with 20 Ce. of hot water, and when solution is complete 2 Ce. of brazilwood indicator is added. Centinormal potassium hydrate is added until a permanent pinkish color is produced. The number of Ce. of potassium hydrate required is divided by 10, the number found is subtracted from 10, and the remainder is multiplied by 0.0364, and that product by 50, which will give the percentage of total alkloids in the 2 Gm. of extract taken, it being assumed that stryehnine and brucine are present in equal proportion, and the above factor being found by taking the mean of their respective molecular weights ($334+394\div2=364$).

This very-well designed method was found impracticable in the writer's hands, through difficulty in carrying out the details. The first obstruction encountered was the very nearly constant emulsifying of the chloroform and the consequent refusal of the liquids to separate on standing, and the difficulty and loss of time in managing an emulsion once formed. The U. S. P. directs the immiscible liquids to be "agitated," not shaken; yet if shaking be avoided and the agitation be ever so cautiously managed some emulsion seems unavoidable, whilst a degree and kind of agitation that is short of shaking washes out the alkaloids imperfectly. Emulsions that did form were best managed by running them out into a capsule, driving off the chloroform on a water-bath, returning the dark liquid to the separator, and managing the next chloroform with greater care. But a better expedient was found in a recommendation of A. H. Allen and others, to use a mixture of equal volumes of chloroform (99 p.e.) and ether (96 p.e.). With this mixture, used in large quantity, vigorous shaking and consequent effective washing may be employed with little emulsion, if any, at the last of the washings, the separations being very prompt and sharp, usually ready to draw off within half an hour after shaking. The clear chloroform and ether solutions are better managed if drawn off into and boiled off from a flask, as the dissolving, the heating up and the titration are more easily done in a flask. The solution to be titrated

is always of a full yellow color, from a bright pale yellow to a deep yellow, with a reddish tint by reflected light, a color in which the first increase of pinkish tint is difficult to detect, and the want of sharpness and decision in this end reaction is the persisting difficulty with all methods of titration that were tried, but in comparing indicators brazilwood was found to be inferior to logwood. A decinormal potassium hydrate is preferable to centinormal, as it does not dilute the solution of alkaloids so much, while in accuracy of reading it is far within the limit of error of the indicator.

Chiefly in consideration of these conditions the following method was reached and used :

A fair sample of *nux vomica* is drawn and an average dozen or so of the seed is so milled as to pass through a No. 9 sieve. Of this 10 Gm. is weighed off and exhausted with 10 p.c. acetic acid. This exhaustion is easily and conveniently done in a Soxhlet apparatus, but so large an amount of extractive is washed out by the warm acid, that the extract is very difficult to dry, and afterwards at once forms an emulsion that is difficult and tedious to manage. Cold percolation to complete exhaustion gives a much better result, and is not difficult to effect, provided the powder be moistened for packing with not more than 10 Cc. of the acetic acid, and be not packed too tightly.

The percolate is evaporated to dryness on a water-bath, in a large (12 Cm.) flat-bottom capsule, so that the extract is in a thin layer, easy to dry and easy to dissolve. The weight gives the yield of extract.

If a fluid extract or tincture is to be assayed, it is measured, weighed and dried in the same way.

A mixture is made of 2 volumes of alcohol (91 p.c.), 1 volume of water of ammonia (10 p.c.), and 1 volume of water, and of this, 10 Cc. is poured upon the dry extract in the capsule. Then by patiently moving a stirrer over the smooth surface of the dry extract for a quarter of an hour or more, a smooth solution of the extract, easy to wash, is obtained. This is poured into a separator of 150 Cc. capacity, and the capsule and stirrer are rinsed clean with 10 Cc. more of the alcohol and ammonia solution.

A mixture is made of equal volumes of chloroform (99 p.c.) and ether (96 p.c.), and 40 Cc. of this is added to the liquid in the separator, and the whole is shaken vigorously during five minutes, and then allowed to separate. In twenty to thirty minutes the separation will be complete to a sharp line, when the depth of the upper,

dark stratum should be observed and measured. The chloroform-ether solution is then drawn off into a tared flask of about 100 Cc. capacity, and the flask is immersed in a hot water bath so that the chloroform-ether may be boiled off by the time another washing is ready. In the meantime 40 Cc. more of chloroform-ether has been added to the contents of the separator, and the shaking, separating and drawing off into the flask repeated. This second washing may or may not be then followed by a third, managed in the same way, if required.

If after standing, to separate completely a second time, the dark liquid on top shall be found to have increased in depth, the indication is that emulsion has been formed to that extent, and that the chloroform forming that emulsion holds the proportion of alkaloids present in solution at the time that emulsion was formed, and as the chloroform cannot be washed out of an emulsion, so the alkaloids held by that chloroform cannot be washed out. Therefore, in the case of any considerable amount of emulsion after the chloroform-ether solution is drawn off into the flask, the dark liquid is drawn off into the flat capsule and warmed on a water-bath until all the chloroform-ether is driven off. The dark liquid is then returned to the separator and again washed as before. If a small amount of emulsion again forms, as very rarely occurs, the chloroform in it holds so very little alkaloid as to be within the limit of error of the method.

The tared flask will then contain the total chloroform extract, and the weight of this was long erroneously accepted as the weight of alkaloids.

Then 10 Cc. of decinormal sulphuric acid is carefully measured from a burette into the flask, and is rinsed round and warmed by immersion in a water-bath until the soluble alkaloids are dissolved, when the insoluble residue will show how much of this extract is not alkaloid.

Then 20 Cc. of hot water is added to the contents of the flask, and a definite quantity (10 drops) of logwood indicator. The color is then closely observed by transmitted light, and matched by a similar quantity of liquid in a similar flask. Decinormal potassium hydrate is now dropped in from a burette until the color changes slightly to a pinkish tint or shade of the original yellow by transmitted light, and when this hardly perceptible change is now looked at by reflected light the pink tint is very distinct.

The number of Cc. required subtracted from 10 (Cc. of acid used) gives the number of Cc. of acid saturated by alkaloids, and this

number multiplied by the mean of the molecular weights of the two alkaloids ($0.0334 + 0.0394 \div 2 =$) 0.0364, gives the amount of alkaloids obtained from the 10 Gm. of *nux vomica*, the strychnine and brucine being assumed to be present in equal proportions.

Then as 10 is to the product from 10, so is 100 to the percentage of the mixed alkaloids.

NOTE.

The first paper of this number of the *Ephemeris* is simply a reprint of the last paper of the January number, and it is reproduced here for the purpose of bringing it into closer relation with the present second paper on the same subject and thus allowing two drugs of difficult management to be more closely compared.

But the rate of progress made in these two papers has been so slow as to make any general consideration of the Fluid Extracts and Extracts of the Pharmacopœia on the same plan, by the present writer, almost hopeless.

Enough may have been done to show the importance of the subject, and now it is hoped that one or more of the Research Committees of the Pharmacopœia may take up the subject and pursue it in view of the near approach of the Revision of 1900.

In the meantime experience in the use of the new menstruum and in the use of fluid extracts and extracts made with acetic acid is increasing quite rapidly.

The alkaloidal fluid extracts all seem successful both in modes of preparation and uses. Aconite, belladonna, colchicum, conium, hyoseyamus, ipecac, and nux vomica seem to be leaders in this group. Of the glucocidal fluid extracts cascara, digitalis, ergot, sarsaparilla, squill, and valerian seem to take the lead, and it is rare to get a more serious complaint than that of the smell of acetic acid.

July, 1899.

E. R. SQUIBB.

ON ACETIC ACID AS A SUBSTITUTE FOR ETHYL ALCOHOL IN EXTRACTING THE ACTIVE PRINCIPLES OF SOME OFFICINAL DRUGS.

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(FIRST PAPER.)

In the proposed substitution of acetic acid for alcohol as a menstruum for extracting and a vehicle for preserving and administering the active principles of drugs used in medicine, the very first question is as to the therapeutic equivalency. That is, if the presence of the necessary amount of acetic acid in fluid extracts, etc., can be shown to be therapeutically objectionable, or more objectionable than the necessary amount of alcohol, then it is not proper to make the substitutions.

But acetic acid has long been used for the extraction of eantharides, colchicum, ipecacuanha, opium, squill, etc., without developing any known therapeutical objections, and in a limited experience in the extraction of spices, and of some drugs for veterinary use, it gives extracts practically identical with those from alcohol. The acid has a universally accepted food value, not only as a hydrocarbon, but as a mild acidulous aid in the primary processes of digestion, but in the small quantities that would be present in the doses of fluid extracts, it would be practically inert, or at least as nearly inert as the alcohol which it would replace.

Its properties and value as an antiseptic, deturgent and preservative are well known, but whether it would be present in sufficient proportion to preserve such preparations from change during a long time has not yet been determined. The oldest set of samples, made with 10 p.c. acid, are now about two years old and apparently unchanged. Fluid Extract of Ergot, by the officinal process, is preserved by acetic acid in small proportion, as first proposed and used by Prof. Wm. Proctor, Jr., in 1857, and in that case an alcoholic preparation very liable to change has been made permanent.

*This paper must be credited to the *American Journal of Pharmacy*, as it was first published in that journal, Vol. 71, No. 1, p. 1, 1899.

Fluid extracts made with acetic acid menstrua are much more loaded with inert extractive matter than when made with alcohol; and this is a disadvantage, but hardly hurtful, nor more than an inconvenience occasionally.

In compounding prescriptions the acetic acid menstruum has a slight general advantage over alcohol in the amount of precipitation on dilution and on mixing, and in the character of the precipitates, these being more soluble, and containing less resin and fat and probably less of the active principle. In administration there are similar slight advantages over alcohol in that the dilutions with water at the moment of taking the doses are less muddy and unsightly, whilst the acidulous taste is less disagreeable.

From these considerations and from all that is as yet known, it is claimed that there are no serious therapeutical nor administrative objections to a more extended and more general trial of this proposed substitution, especially by the pharmacopœial authorities through the Research Committees.

The chief, though possibly not the only reason for a careful consideration of this proposed substitution is economy in the use of alcohol by the use of a cheaper solvent. The Alcohol of the U. S. Pharmacopœia, 91 p.c. by weight, costs about \$2.40 per gallon of 6 pounds 13 + ounces avoirdupois, or, say, 35 + cents per avoirdupois pound—or, say, 77 + cents per 1000 Gm.

The Acetic Acid of the U. S. P., 36 p.c., costs about 10 cents per pound, or 22 cents per 1000 Gm. When diluted to a strength of 10 p.c., which is the strength most frequently required as a menstruum, the cost is less than 3 cents per pound, as against 18 cents per pound for the Diluted Alcohol of the U. S. P., with which this 10 p.c. acid corresponds—the alcoholic menstrua costing six times as much as the acid menstrua to accomplish the same extraction.

In order to measure with a fair degree of accuracy the comparative capacity of alcohol and acetic acid for extracting the active principles of drugs, it was proposed to make parallel extractions of the same drug under the same conditions at the same time. In selecting a drug for the first trial, that is most difficult to extract to complete exhaustion, *nux vomica* was taken. For the extraction of this important drug the U. S. P. has an excellent formula and process by which the seed is reduced to a powder that passes through a No. 60 sieve—60 meshes to the linear inch—and is percolated to practical exhaustion with a menstruum of about 64.5 p.c. alcohol, to the first part of which a small proportion of acetic acid is added. That

is. 500 Gm. of No. 60 powder is moistened with 500 Cc. of the alcohol to which 25 Cc. of 36 p.c. acetic acid has been previously added, and it is then percolated to exhaustion with the alcohol without further addition of acetic acid. This powder and menstruum were used on one series of percolations in competition with a 10 p.c. acetic acid on a very coarse powder in a corresponding series of percolations. The weight of 100 Cc. at about 23°C. of the U. S. P. menstruum with acetic acid was 88.70 Gm.—without the acid 88.00 Gm., and the same volume of the acetic acid menstruum at the same temperature weighed 101.43 Gm. The percolates were received in 100 Cc. fractions in narrow-neck flasks, and weighed at about this temperature, and the weights of the menstrua subtracted from the weights of the percolates gave the series of differences that are shown in the table to indicate the rates of exhaustion.

About 10 kilogrammes of good, well-seasoned *nux vomica* was taken from a lot of 2,300 pounds and very coarsely ground so that all of it was passed through a No. 9 sieve. Then half of this was powdered and all passed through a No. 60 sieve for the U. S. P. percolations, thus making sure that the fine and coarse were as nearly alike as practicable. Then each portion, fine and coarse, was carefully assayed, the powder giving 2.80 p.c. of mixed alkaloids, and the ground giving 2.93 p.c. of mixed alkaloids; and therefore 1500 Gm. of the powder would contain 42.00 Gm. of alkaloids and the same quantity of ground would contain 43.95 Gm. of mixed alkaloids, to be washed out by the different menstrua.

The process of Repercolation* was used for the extractions, and syphon percolators—and these were so managed that the mass of solid contents was kept entirely filled with the menstruum as indicated by a stratum of menstruum on top of the mass and the percolate rising in the well-tube to near the level of the menstruum on top. This mass in saturation was allowed to stand covered for 48 hours when the syphon was put in place and started, being held so high as to draw only from the upper part of the well-tube, and at a rate of dropping so slow as to yield two to three fractions of 100 Cc. each in the 24 hours.

*This process of Repercolation originated with the writer thirty odd years ago, see Proceedings of the Amer. Pharm. Asso., for 1866, p. 85, and was elaborated through a series of papers on economizing the use of alcohol in extracting drugs, published through several years' Proceedings for 1855, p. 201; 1867, p. 391; 1870, p. 166; 1872, p. 182. This last paper is a note on a new form of percolator, and in it the syphon percolator now used for so many years, is first described and figured. The final paper of this series is in Proceedings for 1873, p. 548.

If this dropping could be so slow that its rate when multiplied into the whole mass would reduce the downward flow of the liquid between the solid particles to the same rate of downward flow as that which passed through the particles, then the percolation would be ideal, and one stratum of menstruum would pass downward as a piston, and the exhaustion would be complete with the smallest quantity of solvent that could hold all the soluble matters. This principle, underlying all percolation, being kept in mind, the rate was kept slow, and to control loss by evaporation the outer, turned up end of the syphon was kept well within the flask receiving the fraction of percolate.

Three portions of 500 Gm. each of each powder—fine and coarse—were taken for the repercolation and parallel perecolations were carried along together, the fine U. S. P. powder with the U. S. P. alcoholic menstruum, and the coarse with the acetic acid menstruum. The percolates were received in long-necked 100 Cc. flasks re-marked for that capacity at 23°C. Each fraction as received was adjusted to the mark and weighed, the weighing being done to the nearest centigramme, and the measuring to the nearest tenth of a cubic centimetre.

From the weight of each 100 Cc. fraction the weight of the menstruum was subtracted and the difference noted. These differences make up the following table, which shows approximately the rate of exhaustion as each fraction was received.

The first portion of 500 Gm. of U. S. P. fine powder was moistened with the U. S. P. proportion, or 500 Cc. of 64.5 p.c. alcohol, to which 25 Cc. of 36 p.c. acetic acid had been previously added, and macerated for 48 hours in a closely covered vessel. It was then packed in a syphon percolator and 600 Cc. of the 64.5 p.c. alcohol, without acetic acid, was poured on top in successive portions of about 100 Cc. each until a stratum remained permanent on top, and the percolate in the central well-tube stood nearly up to the level of the stratum of menstruum on top. In this condition it was closely covered and allowed to digest for 24 hours. Then the syphon was put in place, started and adjusted so high as to control the rate of dropping to an average of about 3 to 4 drops per minute during the day, and very much slower, or at rest, during the night, when the columns in the syphon legs reached a balance, as no more menstruum was poured on top during the night.

The 1st five fractions after having been separately weighed were added together in a 500 Cc. flask re-marked for 23°C., and the few

drops needed to make up the measure were added from the sixth fraction.

Then 10 Cc. of this 500 was carefully measured off into a 12 Cm. flat bottom, tared capsule, and evaporated on a water-bath until it nearly ceased to lose weight. The weight of this extract multiplied by 50 was accepted as the total extract contained in the 500 Cc. of percolate.

The 2d five fractions of percolate were weighed, the differences taken, and they were then added together and made up to 500 Cc., as before, and then 25 Cc. of 36 p.c. acetic acid having been added, the 525 Cc. was used to moisten the second portion of 500 Gm. of fine U. S. P. powder. This was then digested, packed and percolated as the first portion, and the fractions of weak percolate from the first portion first, and fresh menstruum afterwards, were poured on top until the exhaustion was complete, as judged by the weight and taste of the fractions. The fractions of this second portion were managed exactly as those from the first portion, and 10 Cc. of the 500 evaporated to dryness for proportion of extract in the same way, and the capsule and extract were reserved for assay.

The 2d five fractions of the second portion were put together, made up to 500 Cc., 25 Cc. of 36 p.c. acetic acid added, and the whole 525 Cc. used to moisten the third and final portion of 500 Gm. of U. S. P. fine powder. Then this final third portion was percolated exactly as was the second portion, the fractions of weak percolate from the second being put upon the third, and then fresh menstruum to exhaustion. As the repercolation was not to be carried farther in this instance, there was no present use for the fractions of weak percolate coming from this third portion, except to show the extent and rate of exhaustion—the exhaustion being found to be practically, though not quite, complete after the seventeenth fraction, as judged by the bitterness of the residue and the assays when the percolation was carried on to the twentieth fraction. The 1st five fractions of this third portion were put together and made up to 500 Cc. as in the other portions, and, by assay, this 500 Cc. was found to represent the 500 Gm. of fine powder in the proportions of Cc. for Gm. The 2d and 3d five fractions of this third portion were made up to 500 Cc. each and were weighed and assayed for extracts and for alkaloids; and, finally, the seventeenth fraction was also assayed, thus finishing the series managed by the excellent process of the U. S. P. with the alcoholic menstruum, and with such results the principal reasons for substituting acetic acid for alcohol are economy in cost and easier and better exhaustion.

The parallel repercolations to be compared with this U. S. P. process as a standard, were managed exactly in the same way, at the same time, with only the difference that the 1500 Gm. of the same nux vomica was very coarsely ground, and 10 p.c. acetic acid was used as a menstruum instead of the U. S. P. alcohol. The very coarse grinding not only saves much labor, but is essential to the success of the acid menstruum, since with a fine powder the mass is liable to form a mud-like mixture that is not percolable. With this difference only, the description of the U. S. P. process applies equally to that with the acetic acid menstruum, and the following table gives the differences in weight for each 100 Cc. fraction, between the weight of 100 Cc. of menstruum and 100 Cc. of percolate. The weight of 100 Cc. of that part of the U. S. P. menstruum that contained the acetic acid was 88.70 Gm. An equal volume of the alcohol menstruum without acetic acid was 88.00 Gm. The weight of 100 Cc. of the 10 p.c. acetic acid menstruum was 101.43 Gm. These weights added to the differences of the table give the weights of the fractions of percolate.

RATE AND DEGREE OF EXHAUSTION BY DIFFERENCES.

PERCOLATE.	FIRST PORTION.		SECOND PORTION.		THIRD PORTION.	
	U. S. P. Differ- ences. Gm.	Acetic Acid. Differ- ences. Gm.	U. S. P. Differ- ences. Gm.	Acetic Acid. Differ- ences. Gm.	U. S. P. Differ- ences. Gm.	Acetic Acid. Differ- ences. Gm.
1st Fraction.....	3.34	6.03	3.69	7.16	5.89	7.42
2d " 	3.66	5.77	4.48	7.26	6.07	7.68
3d " 	3.22	5.01	4.53	6.48	5.70	6.69
4th " 	2.69	4.42	4.46	6.03	5.54	5.71
5th " 	2.09	3.47	3.91	4.83	4.78	5.37
6th " 	2.23	2.84	4.29	4.22	4.72	4.86
7th " 	1.79	2.17	3.19	2.91	3.50	4.26
8th " 	1.33	1.95	2.40	2.02	3.06	3.00
9th " 	1.17	1.21	1.57	1.44	2.33	1.97
10th " 	1.12	.85	1.43	1.18	1.89	1.52
11th " .....	.77	.72	.94	.74	1.69	1.02
12th " .....	.51	.40	.94	.72	1.52	.86
13th " .....	.37	.06	.70	.53	1.16	.62
14th " .....	.27	.18	.84	.37	1.00	.72
15th " .....	.15	.09	.36	.33	.79	.33
16th " .....	.19	.13	.33	.26	.76	.43
17th " .....	.11	.05	.34	.29	.65	.27
18th " .....			.26	.14	.61	.32
19th " .....			.18	.00	.47	.11
20th " .....					.33	.06

The next table deals with the percolates in groups of five fractions each, the measure being made up to 500 Cc. as described above, and these larger fractions were assayed for measure and weight of fraction—for total extract—for chloroform extract and for total of mixed alkaloids.

The most significant showing of this table, and the most important to the proposed substitution, is, that in the first three lines of the table the alcoholic menstruum has extracted 85.3 p.c. of the total alkaloids present, while the acetic acid menstruum has extracted 89.8 p.c. And that in the fifth line the amount of alkaloids not extracted is as 91 for the U. S. P. menstruum against 27 for the acetic acid menstruum.

Then, as a broad general result, it is claimed to have been shown that by the substitution of the acetic acid menstruum for the alcoholic, one-half the cost of grinding, and five-sixths of the cost of menstruum are saved, an equivalent product being obtained in larger quantity.

NUX VOMICA REPERCOLATIONS.

Three Successive Portions of 500 Gm. each for each Menstruum.

500 Gm. PORTIONS.	500 Cc. PERCO- LATES.	U. S. P. MENSTRUUM. 64.5 p.c. Alcohol with a small proportion of Acetic Acid.				ACETIC ACID MENSTRUUM. 10 p.c. Acetic Acid.			
		Weight Gm.	Ex- tract. Gm.	Chlo- roform Ext'ct. Gm.	Alka- loids. Gm.	Weight Gm.	Ex- tract. Gm.	Chlo- roform Ext'ct. Gm.	Alka- loids. Gm.
1st Portion	1st 500 Cc.	457.76	54.80	15.50	10.56	551.20	78.00	12.00	11.19
2d "	1st 500 Cc.	463.88	60.00	17.50	12.01	538.10	104.00	16.00	13.74
3d "	1st 500 Cc.	471.05	72.50	20.00	14.74	539.69	104.80	21.00	14.65
" "	2d 500 Cc.	454.38	30.50	9.50	5.46	521.80	51.50	9.50	4.20
" "	3d 500 Cc.	443.36	2.50	1.00	0.91	508.36	4.00	0.50	0.27
" "	17th Fraction	88.65	0.40	0.16	0.07	101.70	0.48	0.08	0.06
					43.75				44.11
					Original assays..	42.00			43.95

The weighing and measurements of the first three columns of the table are actual upon the scale of the figures given. Those of the other columns were obtained as follows: 10 Cc. was accurately measured off from each 500 Cc. of percolate, and was evaporated until it practically ceased to lose weight. The weight of this extract multiplied by 50 is given in columns 4 and 8 as being the extract present in the 500 Cc. This extract from 10 Cc. was then

dissolved in ammoniated alcohol and the alkaloid shaken out with chloroform and ether mixture. The chloroform and ether were boiled off and the extract dried until it practically ceased to lose weight. This weight multiplied by 50 is given in columns 5 and 9 as being the chloroform extract in the 500 Cc. of percolate. This extract titrated with decinormal acid and alkali gave the total alkaloids in the 10 Cc. which, multiplied by 50 gave the figures of columns 6 and 10. Hence all these figures are subject to the risk of multiplication of error. But when they are compared with the actual assays of the drug percolated, they are as close as could be expected. The original assays were for the U. S. P. fine powder 2.80 p.c., or 42 Gm. in the 1500 Gm. of powder against 43.75 Gm. as footed up in the table.

For the coarsely ground drug the original assay was 2.93 p.c., or 43.95 Gm. in the 1500, against 44.11 Gm. as footed up in the table.

It will be seen by the table that the first 500 Cc. of the third 500 Gm. of both powders give a fluid extract that represents Cc. for Gm., but 100 Cc. of these will contain 2.8 Gm. of mixed alkaloids instead of 1.5 Gm. as prescribed by the U. S. P. for its Fluid Extract.

These fluid extracts are both very dark brown liquids, the alcoholic one being much the darker, and after six weeks standing it is very bright and clear, and has a very small gray deposit. That with the acid menstruum is clear and fairly bright, and without deposit. It has a very distinctly acid odor—stronger of acid than the other has of alcohol, and it contains about 8.1 p.c. of free acid. The dose of the Fluid Extract being about 0.18 Cc., or three minims, this proportion of free acid in it would not be perceptible, and would be entirely insignificant.

The tables show that the acid preparation has a much larger proportion of inert extractive matter, and this would be objectionable if it was largely precipitable on dilution. But it gives much less precipitate on dilution than the alcoholic, and that which it does give is not liable to carry down alkaloids soluble in an acid solution.

Actual experience in the use of preparations made with the new menstruum is as yet not large. Still, throughout the past two years, a steadily increasing number of fluid extracts and extracts have been made and have been confidently supplied and recommended in the veterinary profession where large doses are required, and where

diminished cost is of great importance, and where close observation of effects and results are easily made. As a result of this distribution many letters have been received from veterinary surgeons to the effect that the use has been quite successful, and that in the increasing list, now embracing all of the more important extracts and fluid extracts, no drawbacks have yet been discovered.

There has seemed to be no necessity for a new or changed name for these preparations. They are simply extracts and fluid extracts made with a new menstruum, and when they are recognized by the U. S. P., the present officinal names will doubtless remain unchanged, as it is only the menstruum that is changed, the quality and strength being undisturbed. For the present it is considered sufficient to place conspicuously on the label, under the U. S. P. title, the words "Made with acetic acid," especially as the new menstruum involves no increase of risk of serious mistakes.

It is proposed that the next paper shall investigate the very important and very difficult exhaustion of Cinchona.

THE ASSAY PROCESS.

Early in this investigation it became necessary to have a convenient and fairly accurate process of assay for the mixed alkaloids. The short and easy methods of Messrs. Dunstan and Short, given in the *British Pharm. Journ. and Trans.*, 3d Series, Vol. XIII, pp. 665-1055, and Vol. XIV, p. 621, and given in the *British Pharmacopœia*, were found objectionable on some accounts, but chiefly because the results are too high. For example, a table is given at p. 1055, wherein from seven samples the percentage of total alkaloids ranged from 3.04 to 3.90 p.c., with an average of 3.29 p.c. This, in the writer's experience, is much too high, and there is a probability that the plus error may be due to weighing the chloroform extract as alkaloids. The most recent authority noticed is the new, 1898, *British Pharmacopœia*, but its method is liable to the same objection of weighing a chloroform extract as alkaloid. The U. S. *Pharmacopœia* of 1890 has an excellent method that avoids this source of error by titrating the alkaloids. This method—U. S. P., 1890, pp. 152, *et seq.*—first makes a dry extract and then assays that for use in its standardized preparations.

Two grammes of the dry extract is dissolved by shaking in a separator with 20 Cc. of a previously-made mixture of 2 volumes of alcohol (91 p.c.), 1 volume of water of ammonia (10 p.c.), and 1

volume of water. Then 20 Cc. of chloroform (99 p.e.) is added and the mixture is agitated during five minutes. The chloroform is then allowed to separate and is drawn off as far as possible by the stopecock. This washing out is repeated with two farther portions of chloroform of 15 Cc. each. The chloroform solutions are then collected in a beaker and exposed on a water-bath until the chloroform and ammonia are completely dissipated.

Then 10 Cc. of decinormal sulphuric acid is added, stirred, diluted with 20 Cc. of hot water, and when solution is complete 2 Cc. of brazilwood indicator is added. Centinormal potassium hydrate is added until a permanent pinkish color is produced. The number of Cc. of potassium hydrate required is divided by 10, the number found is subtracted from 10, and the remainder is multiplied by 0.0364, and that product by 50, which will give the percentage of total alkaloïds in the 2 Gm. of extract taken, it being assumed that strychnine and brucine are present in equal proportion, and the above factor being found by taking the mean of their respective molecular weights ($334+394 \div 2 = 364$).

This very-well designed method was found impracticable in the writer's hands, through difficulty in carrying out the details. The first obstruction encountered was the very nearly constant emulsifying of the chloroform and the consequent refusal of the liquids to separate on standing, and the difficulty and loss of time in managing an emulsion once formed. The U. S. P. directs the immiscible liquids to be "agitated," not shaken; yet if shaking be avoided and the agitation be ever so cautiously managed some emulsion seems unavoidable, whilst a degree and kind of agitation that is short of shaking washes out the alkaloids imperfectly. Emulsions that did form were best managed by running them out into a capsule, driving off the chloroform on a water-bath, returning the dark liquid to the separator, and managing the next chloroform with greater care. But a better expedient was found in a recommendation of A. H. Allen and others, to use a mixture of equal volumes of chloroform (99 p.c.) and ether (96 p.e.). With this mixture, used in large quantity, vigorous shaking and consequent effective washing may be employed with little emulsion, if any, at the last of the washings, the separations being very prompt and sharp, usually ready to draw off within half an hour after shaking. The clear chloroform and ether solutions are better managed if drawn off into and boiled off from a flask, as the dissolving, the heating up and the titration are more easily done in a flask. The solution to be titrated

is always of a full yellow color, from a bright pale yellow to a deep yellow, with a reddish tint by reflected light, a color in which the first increase of pinkish tint is difficult to detect, and the want of sharpness and decision in this end reaction is the persisting difficulty with all methods of titration that were tried, but in comparing indicators brazilwood was found to be inferior to logwood. A decinormal potassium hydrate is preferable to centinormal, as it does not dilute the solution of alkaloids so much, while in accuracy of reading it is far within the limit of error of the indicator.

Chiefly in consideration of these conditions the following method was reached and used :

A fair sample of *nux vomica* is drawn and an average dozen or so of the seed is so milled as to pass through a No. 9 sieve. Of this 10 Gm. is weighed off and exhausted with 10 p.e. acetic acid. This exhaustion is easily and conveniently done in a Soxhlet apparatus, but so large an amount of extractive is washed out by the warm acid, that the extract is very difficult to dry, and afterwards at once forms an emulsion that is difficult and tedious to manage. Cold percolation to complete exhaustion gives a much better result, and is not difficult to effect, provided the powder be moistened for packing with not more than 10 Ce. of the acetic acid, and be not packed too tightly.

The percolate is evaporated to dryness on a water-bath, in a large (12 Cm.) flat-bottom capsule, so that the extract is in a thin layer, easy to dry and easy to dissolve. The weight gives the yield of extract.

If a fluid extract or tincture is to be assayed, it is measured, weighed and dried in the same way.

A mixture is made of 2 volumes of alcohol (91 p.e.), 1 volume of water of ammonia (10 p.e.), and 1 volume of water, and of this, 10 Ce. is poured upon the dry extract in the capsule. Then by patiently moving a stirrer over the smooth surface of the dry extract for a quarter of an hour or more, a smooth solution of the extract, easy to wash, is obtained. This is poured into a separator of 150 Ce. capacity, and the capsule and stirrer are rinsed clean with 10 Ce. more of the alcohol and ammonia solution.

A mixture is made of equal volumes of chloroform (99 p.e.) and ether (96 p.e.), and 40 Ce. of this is added to the liquid in the separator, and the whole is shaken vigorously during five minutes, and then allowed to separate. In twenty to thirty minutes the separation will be complete to a sharp line, when the depth of the upper,

dark stratum should be observed and measured. The chloroform-ether solution is then drawn off into a tared flask of about 100 Cc. capacity, and the flask is immersed in a hot water bath so that the chloroform-ether may be boiled off by the time another washing is ready. In the meantime 40 Cc. more of chloroform-ether has been added to the contents of the separator, and the shaking, separating and drawing off into the flask repeated. This second washing may or may not be then followed by a third, managed in the same way, if required.

If after standing, to separate completely a second time, the dark liquid on top shall be found to have increased in depth, the indication is that emulsion has been formed to that extent, and that the chloroform forming that emulsion holds the proportion of alkaloids present in solution at the time that emulsion was formed, and as the chloroform cannot be washed out of an emulsion, so the alkaloids held by that chloroform cannot be washed out. Therefore, in the case of any considerable amount of emulsion after the chloroform-ether solution is drawn off into the flask, the dark liquid is drawn off into the flat capsule and warmed on a water-bath until all the chloroform-ether is driven off. The dark liquid is then returned to the separator and again washed as before. If a small amount of emulsion again forms, as very rarely occurs, the chloroform in it holds so very little alkaloid as to be within the limit of error of the method.

The tared flask will then contain the total chloroform extract, and the weight of this was long erroneously accepted as the weight of alkaloids.

Then 10 Cc. of decinormal sulphuric acid is carefully measured from a burette into the flask, and is rinsed round and warmed by immersion in a water-bath until the soluble alkaloids are dissolved, when the insoluble residue will show how much of this extract is not alkaloid.

Then 20 Cc. of hot water is added to the contents of the flask, and a definite quantity (10 drops) of logwood indicator. The color is then closely observed by transmitted light, and matched by a similar quantity of liquid in a similar flask. Decinormal potassium hydrate is now dropped in from a burette until the color changes slightly to a pinkish tint or shade of the original yellow by transmitted light, and when this hardly perceptible change is now looked at by reflected light the pink tint is very distinct.

The number of Cc. required subtracted from 10 (Cc. of acid used) gives the number of Cc. of acid saturated by alkaloids, and this

number multiplied by the mean of the molecular weights of the two alkaloids ($0.0334 + 0.0394 \div 2 =$) 0.0364 , gives the amount of alkaloids obtained from the 10 Gm. of *nux vomica*, the strychnine and brucine being assumed to be present in equal proportions.

Then as 10 is to the product from 10, so is 100 to the percentage of the mixed alkaloids.

ON ACETIC ACID AS A SUBSTITUTE FOR ETHYL ALCOHOL IN EXTRACTING THE ACTIVE PRINCIPLES OF SOME OFFICINAL DRUGS.

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(SECOND PAPER.)

In continuing this subject for a second paper the writer refers to, without repeating, the introductory matter of the first paper, where the therapeutic and pharmaceutic bearings of such a substitution are discussed and passes at once to the farther work which is relied upon to support or oppose the proposed substitution and define the limits of its application.

In the meantime it may be well to state that the guarded use of extracts and fluid extracts made with acetic acid has continued and extended in veterinary therapeutics with only favorable reports, so that such a class of preparations may fairly be considered as established for veterinary practice where the large quantities used make the reduced cost a very important consideration. Some hospitals are also still using them in increasing quantities without discoverable objection. The number of physicians known to be using them in private practice, though not yet large is increasing, and no serious disadvantages have been developed by close and careful observation.

In selecting a drug for competitive investigation in this second paper cinchona was selected first on account of its importance, next on account of the difficulty there has always been in finding a proper menstruum,—next on account of the difficulty of exhaustion by any menstruum hitherto known, and finally on account of the very considerable amount of time and work that the writer has given to it for many years past in papers published from time to time in the *Proceedings of The American Pharmaceutical Association*.†

*This paper must be credited to *The American Journal of Pharmacy*, as it was first published in that *Journal*, Vol. 71, July, 1899.†See *Proceedings* for 1865, p. 214.—1867, p. 391.—1870, p. 161.—1878, p. 715.—*Amer. Journ. Pharm.*, Vol. XXXIX., pp. 398, 408.—*Ephemeris*, Vol. I., pp. 76, 105, 146, 174.—Vol. III., p. 993.

A fair grade of yellow cinchona was taken which when carefully assayed by the process to be given in detail farther on, yielded 4.9 p.c. of total alkaloids, of which 2.7 p.c. belonged to the quinine group. This was carefully ground, one portion into a No. 9 powder and another portion to a No. 60 powder. Repercolation was used in exactly the same way as with *nux vomica* in the first paper.

For the U. S. P. No. 60 powder the U. S. P. menstruum of a mixture of 8 volumes of alcohol (91 p.c.) and 2 volumes of glycerin (95 p.c.) was used. For the No. 9 powder a 10 p.c. acetic acid was used. A third single percolation was made of the No. 60 powder with 10 p.c. acetic acid to determine the difference in rate and degree of exhaustion between fine and coarse powder with a 10 p.c. acetic acid menstruum. The U. S. P. menstruum was adopted, first because it is the officinal menstruum, and next because it is pharmaceutically the best menstruum for extracting and holding the active principles in concentrated preparations. But therapeutically these preparations are objectionable because they are overloaded with inert extractive matter, and on dilution either before or after administration deposit copious insoluble precipitates. The percolations were managed exactly as were those with *nux vomica*. Each 100 Cc. fraction as it came off was weighed and the weight of the same measure of menstruum being subtracted the difference was noted to indicate the rate and degree of exhaustion and these differences are shown in the following table.

Each portion consisted of 500 Gm. of cinchona. The first and fourth portions are single percolations with acetic acid, the only difference being in the fineness of powder, and these are compared in the fourth pair of columns. After the 5th fraction of the first portion the successive fractions were used to moisten and percolate the second portion of 500 Gm., and after the 5th fraction of the second portion the successive fractions of weak percolate were used to moisten and percolate the third portion of 500 Gm. This third portion, being the limit to which it was decided to carry the repercolations, had all the fractions of percolate grouped together in groups of five and these larger fractions were reserved for farther comparison and for assay,—each portion having been carried to practical exhaustion by fresh menstruum to follow the weak percolates.

The irregularities in progression of all the columns of the table are doubtless due to irregularities in the packing of the moistened powders and to changes of temperature.

It must not fail to be noticed that although the rate of exhaustion is in favor of the acetic acid it is less favorable than would appear from a casual comparison of the figures. For example, the difference in weight of 100 Cc. of the menstrua is (91.09 from 101.43) 11.06 Gm. The difference between the first pair of figures of the table is $(9.39 - 6.28 =) 3.11$ Gm., or nearly one-half of the acetic acid difference, and therefore to render these columns strictly comparable a considerable addition is due to the figures of the acetic acid columns. But the amount of such addition is so difficult to estimate that it must be left indefinite.

The nearly uniform differences of the first fractions of acetic acid percolate from the first and second portions, and from the first three fractions of the third portion, indicate that the acetic acid menstruum is practically saturated with the constituents of the cinchona that are soluble in this menstruum, whilst the increase in the differences of the first five fractions of U. S. P. percolate of the third portion show that this menstruum has a much greater solvent capacity than the 10 p.c. acetic acid. When the difficult solubility even of the acid salts of the cinchona alkaloids is remembered this saturation is not difficult to comprehend. But when these supposed saturations were tried they were found capable of dissolving considerable quantities of the total alkaloids obtained from the assays of other portions of cinchona.

The fourth portion or final pair of columns is given for the purpose of comparing by differences the rate and degree of exhaustion in two percolations with the acetic acid menstruum, managed in exactly the same way, but differing simply in the fineness of the powder, the apparent result being that the exhaustion was more rapid though hardly more complete in the fine powder as far as the differences go.

RATE AND DEGREE OF EXHAUSTION BY DIFFERENCES.

Percolate in successive frac- tions of 100 cubic centi- metres each.	First Portion.		Second Portion.		Third Portion.		Fourth Portion.	
	U. S. P. No. 60 powder. Differences Grammes.	Acetic Acid No. 9 powder. Differences Grammes.	U. S. P. No. 60 powder. Differences Grammes.	Acetic Acid No. 9 powder. Differences Grammes.	U. S. P. No. 60 powder. Differences Grammes.	Acetic Acid No. 9 powder. Differences Grammes.	Acetic Acid No. 9 powder. Differences Grammes.	Acetic Acid No. 60 powder. Differences Grammes.
1st fraction.....	9.39	6.28	9.41	6.40	11.58	6.43	6.28	5.49
2d ".....	8.36	6.11	8.36	6.18	9.82	6.60	6.11	5.18
3d ".....	6.83	5.51	7.94	5.84	8.81	6.39	5.51	5.10
4th ".....	4.05	4.46	6.57	5.30	7.14	5.49	4.46	4.44
5th ".....	2.64	3.33	5.51	4.40	6.03	4.62	3.33	3.60
6th ".....	1.90	2.30	3.96	3.36	4.73	3.56	2.30	2.65
7th ".....	1.82	1.63	3.34	2.35	4.01	2.61	1.63	2.23
8th ".....	1.51	1.26	2.94	1.88	3.80	2.28	1.26	1.57
9th ".....	1.40	.88	2.83	1.35	3.46	1.60	.88	1.22
10th ".....	1.26	.83	2.39	1.06	3.40	1.35	.83	.97
11th ".....	.73	.43	2.00	.88	3.07	1.05	.43	.70
12th ".....	.44	.51	1.51	.72	2.78	1.05	.51	.74
13th ".....	.64	.40	1.39	.65	2.22	.74	.40	.64
14th ".....	.22	.34	1.14	.61	1.95	.89	.34	.42
15th ".....	.24	.28	1.16	.56	1.50	.67	.28	.35
16th ".....	.99	.69	1.02	.51	1.00	.76	.69	.45
17th ".....	.67	.33	1.06	.45	.66	.69	.33	.41
18th ".....	.57	.39	.80	.46	1.13	.74	.39	.34
19th ".....	.46	.20	.76	.42	.94	.65	.20	.23
20th ".....	.25	.28	.69	.46	.68	.54	.28	.21
21st ".....	.16	.15	.94	.49	.73	.48	.15	.23
22d ".....	.13	.16	.64	.35	.64	.68	.16	.17
23d ".....	.13	.05	.63	.35	1.25	.51	.05	.15
24th ".....	.....	.....	.66	.43	.85	.54	.....	.06
25th ".....	.....	.....	.43	.25	.78	.24	.....	.08
26th ".....	.....	.....	.53	.35	.58	.50	.....	.06
27th ".....	.....	.....	.46	.24	.67	.35	.....	.08
28th ".....	.....	.....	.45	.33	.40	.50	.....	.04
29th ".....	.....	.....	.39	.20	.30	.24	.....	.02
30th ".....	.....	.....	.30	.23	.14	.40	.....	.09
31st ".....	.....	.....	.23	.13	.22	.17	.....	.....
32d ".....	.....	.....	.16	.08	.10	.33	.....	.....
33d ".....	.....	.....	.....	.....	.17	.17	.....	.....
34th ".....	.....	.....	.....	.....	.17	.19	.....	.....
35th ".....	.....	.....	.....	.....	.10	.12	.....	.....
36th ".....	.....	.....	.....	.....	.08	.12	.....	.....
37th ".....	.....	.....	.....	.....	.17	.09	.....	.....
38th ".....	.....	.....	.....	.....	.08	.64	.....	.....

The fractions of the above table were put together in successive groups of five fractions each, the exact measure of 500 Cc. being made up from the next percolate in succession. In this way the 100 Cc. fractions were concentrated into 500 Cc. fractions, which were weighed as well as measured and the differences taken, these larger fractions being carried through in pairs, each being assayed for the total alkaloids contained. For these assays 10 Cc. of the stronger liquids was taken and the results multiplied by 50. For the weaker liquids 20 Cc. was taken and the results multiplied by 25. Each of the three portions consisted of 500 Gm. of cinchona and each large fraction consisted of 500 Cc. of percolate.

Of the 1st and 2d portions only the 1st 500 Cc. of percolate was reserved, the succeeding fractions from the 1st portion being used as menstruum for the 2d and those from the 2d portion being carried to the 3d portion. But all the fractions from the 3d portion to practical exhaustion were reserved and assayed, and if the re-percolation had been carried farther these fractions would have been successively used as menstruum on a fourth portion of cinchona.

The single separate percolation, "Fourth Portion" of the table above, made for the purpose of comparing the results from the use of fine powder against coarse, does not enter the following table, as these were only comparable assays. The 1st 500 Cc. from coarse powder had 7.5 Gm. of alkaloids, while the similar fraction from fine powder gave 8.2 Gm. of alkaloid. This leads directly to the conclusion that if fine powder had been used for the principal series of comparisons the results given in the following table would have been more favorable to the acetic acid menstruum by about 9 p.c.

ASSAYS OF CINCHONA PERCOLATES.

500 Gm. PORTIONS.	500 Cc. PERCOLATES.	U. S. P. MENSTRUUM. 800 Cc. ALCOHOL, 91 P.C. 200 Cc. GLYCERIN, 95 "			ACETIC ACID MENSTRUUM. 10 P.C. ACETIC ACID.		
		Weight Gm.	Differ- ence Gm.	Total Alka- loids Gm.	Weight Gm.	Differ- ence Gm.	Total Alka- loids Gm.
1st Portion	1st 500 Cc.	487.9	32.0	12.1	534.0	26.8	7.5
2d "	1st 500 Cc.	495.8	39.8	12.7	537.5	30.3	11.9
3d "	1st 500 Cc.	499.8	44.5	19.5	537.8	30.1	14.9
" "	2d " "	475.1	19.9	9.4	519.3	11.6	9.5
" "	3d " "	468.2	13.0	4.3	511.9	4.2	6.9
" "	4th " "	460.2	5.0	2.7	510.7	3.0	5.9
" "	5th " "	459.8	4.5	2.5	510.2	2.5	3.8
" "	6th " "	457.7	2.4	1.7	509.6	1.9	3.5
" "	7th " "	456.2	1.0	1.6	509.1	1.4	3.0
" "	8th " "			1.1			1.1
" "	9th " "			0.7			0.8
				68.3			68.8
1500	Gm. Cincho na of 4.9 p.c. =			73.5			73.5

In summarizing the results of this work the following conclusions are reached and adopted :

That 10 p.c. acetic acid is a good menstruum for the exhaustion of cinchona.

That the U. S. P. menstruum is a better one for rapid exhaustion, but the percolates are so loaded with useless and objectionable organic matters from which the acetic acid percolates are comparatively free, that this difference in the character of the results transfers the advantages to the acetic acid side. The stronger percolates from the alcohol and glycerin menstruum are almost syrupy in consistence, are so black as to be almost intraspresent, are very astringent, and throw down an unmanageable precipitate of nearly insoluble cincho-tannates on dilution or admixture with other preparations or any ordinary diluents. These disadvantages are of so serious a character as to have always obstructed the use of the official Fluid Extract and Extract.

The acetic acid stronger percolates are nearly free from these disadvantages, and are far more manageable pharmaceutically as well

as therapeutically. It is hardly within the range of possibility that a fluid extract or extract which on dilution splits up into insoluble or difficultly soluble cincho-tannates can be a good therapeutic agent, or that a preparation of the same alkaloidal strength that does not so split on dilution is not better.

The difference in the cost of the two menstrua is very great, the alcoholic menstruum costing about eight times as much as the acid, whilst the acid is much easier to manage in the percolation and in the standardizing process, since evaporation does not injure the percolates nor materially increase the cost by the loss.

The U. S. P. standardizes its preparations of yellow cinchona in an indirect way by requiring that the cinchona from which they are made shall contain not less than 5 p.c. of total alkaloids and at least 2.5 p.c. of quinine, by an assay process which it gives, wherein a chloroform extract is weighed as total alkaloids. Although this is not the only objection to this assay process, it secures a cinchona powder that should contain at least 5 p.c. of total alkaloids, equal to 50 Gm. in 1000 or 25 Gm. in 500. The cinchona used for this investigation contained 4.9 p.c. of total alkaloids equal to 49 Gm. in 1000 or 24.5 Gm. in 500, or say in 500 Cc. for facility of comparison, although this 500 Cc. weighs 534 Gm.

The U. S. P. requires for its Fluid Extract that 1000 Cc. should represent 1000 Gm. of 5 p.c. cinchona, or 500 Cc. containing 25 Gm. of alkaloids from 500 Gm. of cinchona. No one of the 1st percolates from either portion by either menstruum come up to this official requirement, but those by the acid menstruum were easily brought to it by evaporation.

The 1st 500 Cc. of the 1st portion was evaporated to 150 Cc. and then contained the proportion of 25 Gm. of alkaloids in 500 Cc.

The 1st 500 Cc. of the 2d portion was evaporated to 238 Cc., and then contained the official proportion of 25 Gm. of alkaloids in 500 Cc.

The 1st 500 Cc. of the 3d portion was evaporated to 298 Cc., and then contained the official proportion of 25 Gm. of alkaloids in 500 Cc.

In the first of these three the loss in standardizing by evaporation was greatest, and then it amounted to about 350 Gm. of 10 p.c. acid at a cost of less than 4 cents. But this is a maximum loss that in practice could rarely exceed half this amount.

In assaying these extracts before the evaporation and after, very slight loss of alkaloids was discovered, and it is believed that these

are fairly safe in acid solution with no greater heat than a water-bath.

This point is in favor of the acid menstruum, since it is the common experience that evaporation with alcoholic menstrua generally reduces the proportion of alkaloids, changing them and probably oxidizing them as is not probable with acid salts and solutions of most alkaloids.

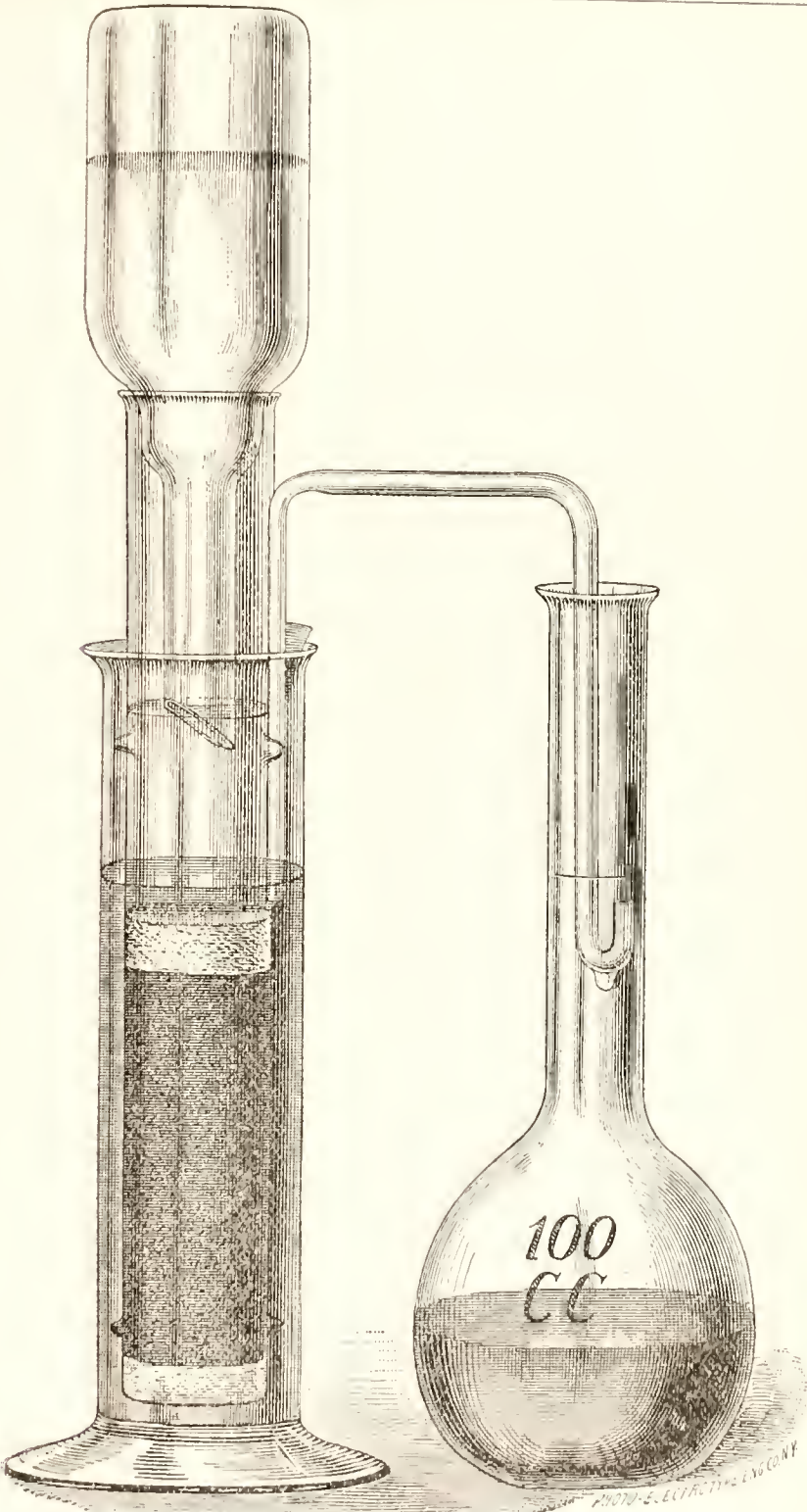
It was desirable to know with a fair degree of accuracy how much free acid an acetic acid fluid extract of cinchona with this menstruum would contain, and in the above-described three portions of fluid extract, the proportion was found to be 11, 10.2, and 10 p.c., and where there had been most evaporation there was least free acid. The lowest of these proportions is quite sufficient to secure the stability and permanency of the preparations under all ordinary conditions. When this fluid extract is mixed with 3 or 4 times its volume of water the mixture has the appearance of coffee with milk, and in this condition the taste of free acid is very slight and not disagreeable, and the conclusion is reached that in all discovered ways it is a better therapeutic agent and a more eligible preparation than the official Fluid Extract and at far lower cost.

THE ASSAY PROCESS FOR CINCHONA.

The cinchona should be in fine powder for complete exhaustion, and the harder the bark the finer the powder should be. The U. S. P. directs a No. 60 powder for its preparations, but No. 80 or finer for its assay process. The B. P. directs No. 60 for both preparations and assay. But the results obtained here by the use of 10 p.c. acetic acid as a menstruum show that complete exhaustion is easily obtained with a No. 9 powder for the assay process.

The apparatus and management are however of great importance in obtaining complete exhaustion if the residue is to be, as it should be, bitterfree when well chewed. This is so difficult and of so much importance that it appears to be worth while to offer a cut of an extractor that has been very successful in the extraction of nuxvomica and now in the still more difficult cinchona, and that is expected to be equally applicable to many other substances.

This simple apparatus is shown in operation. The flattened end of the test tube has five small holes that cannot be shown, and a small rubber band is better to hold the syphon in place than the wedge as shown. The apparatus is easily made up from laboratory materials by any fairly expert glass-worker, though it may be cheaper



EXTRACTOR.

to pay Greiner a dollar and a half for it. It is simply a modification on a small scale of the writer's syphon percolator now so many years in successful use, in all sizes up to 100 gallons (see *Proceedings of The Amer. Pharm. Asso.* for 1872). It is the best form of percolator because it best applies the mechanical conditions requisite for complete exhaustion. That is, the whole mass of powder to be extracted is, from first to last, kept completely filled, inside the particles and between them, with the extracting menstruum and counterbalanced to an equilibrium by liquid that has already passed through the saturated powder. The syphon draws off the liquid from near the surface of this outer column at a rate controlled by the depth to which the end is immersed and by the head of menstruum supplied to the powder on top. The inverted bottle of menstruum supplies a nearly continuous feed from a nearly constant level. The whole mass being full of liquid, the outside column nearly level with the inside supply, the syphon is filled, put in place and held in position, where by raising or lowering it is made to deliver from 3 to 5 drops per minute. Now, in this position the laws of hydrostatics require that the first drop that falls from the syphon sets the whole mass of liquid in motion, but with such extreme slowness in the powder, that friction is reduced to a minimum and the liquid in the particles descends at a rate approaching that between the particles, thus securing a displacement of the soluble parts of the powder with the least obstruction from the insoluble parts. If the rate of descent could be made so slow as to eliminate friction, then each stratum of solvent liquid would descend as a piston and complete exhaustion would be attained with the smallest quantity of solvent.

Ten grammes of the powdered cinchona in a capacious capsule is moistened with 10 Cc. of 10 p.c. acetic acid, the lumps all well broken up, the moist powder packed firmly in some form of percolator and percolated to complete exhaustion with 10 p.c. acetic acid. If this exhaustion be done in the extractor figured above about 36 hours' time will be required and the percolate will measure 180 to 200 Cc. The degree of exhaustion is judged by the degree of bitterness of the final percolate which is not quite bitterfree when the cotton and the lower part of the powder is quite bitterfree though not tasteless.*

* In these percolations, especially when on a larger scale, it is difficult to get a bitterfree final percolate and residue, so that it was desirable to know how much bitterness was consistent with practical exhaustion. A

The entire percolate is evaporated in a flat-bottom capsule to the condition of a soft solid when cold, capable of being stirred when hot. This extract usually weighs 35 to 38 p.c. of the cinchona and it retains a small amount of acetic acid. While heated on the water-bath 30 Cc. of a previously made mixture of 5 volumes of 10 p.c. water of ammonia and 15 volumes of 91 p.c. alcohol, is added, the mixture is stirred to a uniform condition and poured into a separator of 160 to 180 Cc. capacity. The capsule is rinsed into the separator with a mixture of 10 Cc. of the ammonia mixture and 10 Cc. of alcohol, and the whole is well shaken together. If much ammonia has been lost in dissolving the extract—if much acetic acid should have been retained in the extract, or if the cinchona should be very rich in alkaloids the 40 Cc. of ammonia mixture may be insufficient to set the alkaloids free. This point is always to be assured by the smell of ammonia at the mouth of the separator, or by holding a strip of wet and neutral litmus paper in the air space of the separator. If the alkaline reaction be not full and prompt 5 Cc. more of the ammonia mixture is added and the shaking and testing repeated.

Then 40 Cc. of chloroform (96 p.c.) is poured into the separator, the whole is vigorously shaken for five minutes and then allowed to separate. This separation requires ten to fifteen minutes and then the chloroform solution is drawn off into a tared flask of about 100 Cc. capacity and is put upon the water-bath to boil off the chloroform. Then 5 Cc. of alcohol (91 p.c.) is added to the residue in the separator, is shaken in, and then a second 40 Cc. of chloroform is added and the whole is again shaken for five minutes, allowed to separate, the chloroform drawn off into the tared flask with the first portion and the whole of the chloroform boiled off in the bath. If the alcohol be omitted from the residue before this second washing an emulsion is almost certain. The apparent excess of chloroform is necessary not so much for the washing out of the alkaloids as to avoid emulsion. The residue is run off from the separator into a beaker, is well stirred, five or six drops is transferred by the stirrer to the end of a strip of bibulous paper

solution of total alkaloids of cinchona of 1 part in 100,000 of water was made and this was perceptibly though faintly and transiently bitter to several, but not to all ordinary tastes. This therefore is not bitterfree. One part in 10,000 was distinctly and rather permanently bitter, and as this is but 0.01 of 1 p.c. it is considered, on the large scale, as practical exhaustion.

and dried on the bath. This when taken into the mouth and well chewed should be bitterfree.

The chloroform solution when the chloroform, ammonia and alcohol are boiled off, leaves a very dark residue in the flask usually weighing about one gramme. This is dissolved in 20 Cc. of chloroform by shaking, and 10 Cc. of water added and shaken. Then 20 Cc. of decinormal sulphuric acid is run into the flask from a burette, shaken for five minutes and poured into a separator. When the liquids separate the lower, chloroform part, is drawn off into the flask again and the upper watery portion into a beaker. Then 10 Cc. more of decinormal acid and 5 Cc. of water are added to the contents of the flask, the whole well shaken for five minutes, returned to the separator, the flask rinsed in with 5 Cc. of water, and the whole well shaken in the separator. When the liquids separate the lower chloroform residue is drawn off into a small beaker and the watery portion into the beaker with the first watery portion. The chloroform residue is now tested by drying upon bibulous paper, as before described, and if found bitterfree it is thrown away, but if still bitter to the taste it is again washed.

To the acid-watery solution in the larger beaker 30 Cc. of decinormal potassium hydrate is added with stirring, the whole transferred to the separator, 25 Cc. of ether (96 p.c.) added and the mixture well shaken. When the liquids separate 5 Cc. of decinormal alkali is poured into the separator producing a large precipitate that is redissolved when shaken. This addition of decinormal alkali is repeated until one addition fails to produce cloudiness. Then the mixture is shaken for five minutes, allowed to separate and the lower watery liquid is drawn off into the larger beaker. The ether solution cannot be drawn off clean through the stopcock, but can be poured off through the mouth of the separator, to the last drop, into a tared beaker, leaving a little emulsion and water drops behind. To these residues in the separator 20 Cc. of ether is added and well shaken, the watery solution from the large beaker added, again shaken for five minutes, allowed to separate, drawn off and poured off as before, and this washing is repeated a third time.

The watery portion is now tested and should be found bitterfree, or be again ether-washed. The ether solutions in the tared beaker are boiled off on the bath and leave a varnish-like residue of an amber color consisting of total alkaloids and a little insoluble waxy matter. This is weighed in order to get the approximate

percentage of alkaloids, and for each one per cent. of these crude alkaloids 5 Cc. of decinormal acid is run into the beaker from a burette and 10 Cc. of water added. But these alkaloids are difficult and slow to dissolve in the acid so that time is saved by dissolving them in 3 or 4 Cc. of ether by rotary agitation, before the acid is run in. When the acid is run in, the waxy and fatty matters are precipitated and a stirrer and warming are then used to free this precipitated matter from alkaloids and to drive off the ether. The alkaloids are thus converted into acid salts and dissolved, and the insoluble matters are deposited on the sides and bottom of the beaker. If the nearly clear solution be poured off and the beaker and residue be dried, weighed and the weight be subtracted from the weight of crude alkaloids, the remainder will be within 0.1 or 0.2 p.c. of the weight of pure alkaloids, and thus will be a useful check upon the titration that is to follow.

In the titration now to be described litmus paper is used as the indicator, and if the paper be good and be well managed the indication is sufficiently accurate, reaching to the second decimal place of percentage. The paper is used in strips 0.5 Cm. wide, some of deep blue, some neutral, and about a centimeter of the end of the strip is wetted for the indication.

Decinormal potassium hydrate solution is dropped from a burette into the acid solution of the alkaloids with stirring and frequent testing until the solution fails longer to change blue litmus paper. When the blue strip is just touched to the surface of the solution, the liquid rises in the paper to about a centimeter. As the neutral point is approached the end will be blue with a red or reddish band above the blue, but when it is reached the whole wetted part will be unchanged blue. Then a strip of neutral litmus paper has the end wetted with distilled water for about a centimeter, and this end is just touched to the surface of the solution and held there for a few seconds. On close inspection by reflected light no difference in tint between the lower and upper parts of the wetted portion will be discoverable. If this be the case, one or two drops more of the decinormal alkali is added and the testing repeated with a new strip of wetted neutral paper. Now a small patch of faint bluish tint will be discoverable about the middle of the wetted portion, and this indicates as nearly as need be the point when all the acid salts have been reduced to neutral salts.

The number of Cc. of decinormal alkali used to reach this point subtracted from the number of Cc. of decinormal acid taken for the

solution, gives the number of Cc. of the acid saturated by the alkaloids to form the neutral salts, and this number divided by 10 gives the amount of normal acid equivalent to the decinormal acid used. This multiplied by the normal molecular weight of the alkaloids would give the weight of alkaloids obtained from the 10 Gm. of cinchona taken. But there are many alkaloids of different molecular weights in cinchona so that it is impracticable to get a molecular weight that would accurately represent any sample of total alkaloids. Perhaps the best that can be done, as has often been done before, is to make an arbitrary composite combining number. All that can be said of this proceeding is that it is very convenient,—that it admits of titration,—that the results cannot be more than about 0.3 p.c. from the truth in rare cases, but must be within 0.1 or 0.2 p.c. in a large proportion of cases, and that is always closer than is the weighing of a chloroform or ether extract as total alkaloids.

The alkaloids of cinchona may be usefully divided into three groups:

First, the quinine group with a molecular weight of about 0.324.

Second, the cinchonine group with a molecular weight of about 0.294.

Third, the remaining alkaloids with a molecular weight of about 0.312.

Practically no cinchona for pharmaceutical uses should contain less than 5 p.c. of total alkaloids, and at least 2.5 p.c. of these should be of the quinine group,—1.25 p.c. of the cinchonine group and 1.25 p.c. of the remaining alkaloids. This proportion being arbitrarily assumed gives a combining weight of 0.314 as follows:—

Quinine group.....	$0.324 \div 2 = 0.162$
Cinchonine “	$0.294 \div 4 = 0.074$
Other alkaloids.	$0.312 \div 4 = 0.078$

Adopted average molecular weight..... 0.314

This 0.314 then is adopted as the factor for total alkaloids in this investigation, and an example will illustrate its use in this paper.

A recent critical assay of 10 Gm. of cinchona by this process gave a varnish-like ether extract that weighed 0.53 Gm., equal to 5.3 p.c. of crude alkaloids. This indicated ($5 \times 5 =$) 25 Cc. of decinormal acid required for dissolving the alkaloids. But these were first dissolved in 4 Cc. of ether, then the acid run in from a burette,

well stirred and warmed to drive off the ether and cause the insoluble matters to adhere to the glass.

Into this solution decinormal alkali was dropped from a burette with stirring until the neutral point was reached as indicated by the use of the litmus paper strips, when it was found that 9.3 Cc. of decinormal alkali had been used. Then 25 Cc. of decinormal acid less 9.3 Cc. of decinormal alkali leaves 15.7 Cc. of the acid as saturated by the alkaloids. Then the result is expressed as follows: $15.7 \div 10 = 1.57 \times .314 = .49298 \times 10 = 4.9$ p.c. alkaloids.

The nearly clear solution was poured off from the residue in the beaker and the residue when dried weighed 0.03 Gm. Then 0.53 Gm. of ether extract or crude alkaloids less 0.03 Gm. of waxy residue left 0.50 Gm. of alkaloids or 5.0 p.c. against 4.9 p.c. by the titration.

In the numerous assays of percolates for the purposes of this paper, a short cut was found which without much sacrifice of accuracy greatly reduced the time and labor required, and seems well adapted to pharmaceutical use.

Ten Cc. of the liquid preparation of cinchona is shaken in a separator, first with 20 Cc. of the ammonia-alcohol mixture, and then with 30 to 40 Cc. of chloroform, the liquids separated as in the preceding assay process, which is then followed up to the point of dissolving the chloroform extract in a fresh portion of chloroform in the flask. If the chloroform extract be under 1 Gm., 10 Cc. of fresh chloroform is sufficient for its solution in the flask, and to this is added 10 Cc. of decinormal acid. The flask is vigorously shaken, 10 Cc. of water added, the shaking repeated and the contents poured into a separator. When separated the chloroform is drawn off into the flask again and the acid solution into a beaker. To the chloroform in the flask 2 Cc. of decinormal acid is added from the burette, well shaken, 5 Cc. water added, the shaking repeated, the whole returned to the separator, the flask rinsed in, and when separated the chloroform is drawn into a small beaker and the watery solution into the beaker with the first portion. The chloroform should then be bitterfree or be again washed. The watery solution in the beaker is now titrated with decinormal alkali.

This process answers fairly well even with the disturbing element of glycerin in the liquid as when the U. S. P. menstruum is used, for the emulsion always formed can be titrated, and is broken up as the decinormal alkali is dropped in with vigorous stirring.

Some of the advantages claimed for this assay process are, first, the complete and easy exhaustion of the cinchona, even when in coarse powder by 10 p.c. acetic acid. Second, the success of the shaking out without emulsion by the use of large quantities of chloroform and very little water, and third, by the control of loss by having all the residues bitterfree before they are thrown away.

ON ACETIC ACID AS A SUBSTITUTE FOR ETHYL ALCOHOL IN EXTRACTING THE ACTIVE PRINCIPLES OF SOME OFFICINAL DRUGS.

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(THIRD PAPER, BELLADONNA ROOT.)

In continuing this subject for a third paper,—see *American Journal of Pharmacy* for January 1899, Vol. 71, No. 1, and Vol. 71, No. 7, for July 1899, and *Ephemeris* Vol. V. No. 3 for July 1899, for the two preceeding papers,—the writer refers to without repeating the introductory matter of the first paper where the therapeutic and pharmaceutic bearings of the subject are discussed and passes on to the farther work which is to be depended upon to support or oppose the proposed substitution, or ascertain the limits of its applicability.

The experimental trials and the actual use,—chiefly in veterinary practice,—of extracts and fluid extracts made with acetic acid have continued since the date of the last paper until now the list embraces some sixty drugs and spices. This increasing experience tends to support two generalizations.

First, that a menstruum of ten per cent. acetic acid is about the weakest that will surely extract, protect and preserve the active principles of many drugs, and that such a menstruum leaves not less than six nor more than eight per cent. of free acid in the finished fluid extract,—and is about equivalent as a menstruum to the officinal Alcohol Dilutum, or forty-one per cent. alcohol.

Second, that from one fourth to one-third of the fluid extracts made with acetic acid give a small deposit within three months,—a proportion not greater than from alcoholic menstrua, and that the deposits from the two menstrua are equally inert.

*This paper must be credited to the *American Journal of Pharmacy* as it was first published in that Journal Vol. 72, No. 1, page 1, 1900.

In selecting a third drug for competitive investigation in this paper belladonna root was taken,—first on account of its importance,—second, because its value depends on the proportion of a definite alkaloid of strong saturating power,—and third because the writer has had much experience with it through many years.

In September 1885, see *Ephemeris* Vol. II. No. 11, p. 848 and 853 the writer published papers on belladonna leaf and belladonna root giving an assay process which with slight modifications and with the addition of titration of the results, has now been in use for about fourteen years. This process is believed to be sufficiently accurate for all practical purposes and is therefore adopted as the basis of this paper.*

An abstract of this process as amended in recent practice, is as follows :

OLDER ASSAY PROCESS.

Fifty grammes of the unpeeled belladonna root in No. 60 powder was equably moistened with 30 Cc of 91 p.c. alcohol to which 4 drops of concentrated sulphuric acid had been previously added.

The moistened powder was then moderately packed in a narrow cylindrical percolator and 100 Cc of 91 p.c. alcohol acidulated with 4 drops of sulphuric acid, was poured on top as fast as the percolator would hold it, a stratum of the menstruum being always kept on top. As soon as the powder was completely filled, and dropping began from below the outlet was closed and a digestion of 24 hours was allowed.

The percolation was then started and maintained at a slow rate of dropping, stopping overnight for a new digestion, until 425 Cc of percolate was received. The farther supply on top was 100 Cc more of the alcohol acidulated with 4 drops of the acid, another 100 Cc acidulated with 2 drops of acid; and then 200 Cc. of the alcohol not acidulated.

The percolate was boiled down in a flask on a water-bath to about

*The use of a good process of assay in the buying of an important drug through a series of years is well illustrated in the writer's experience with belladonna root. In 1885 the best root of the market gave 0.46 to 0.50 p.c. of alkaloids. In creating a demand by rejecting lower grade samples and calling for unpeeled root the quality obtainable has increased from about 0.50 p.c. to 0.68 p.c.

10 or 15 Cc of liquid extract and this was diluted and washed clean into a separator with 25 Cc of water acidulated with 1 drop of acid. The flask was then finally rinsed into the separator with 20 Cc of chloroform, 99 p.c.

The whole was well shaken for 5 minutes, allowed to separate and the chloroform layer drawn off into a second separator.

The acid liquid was again washed twice in the same way with 20 Cc of chloroform.

The 60 Cc of chloroform washings in the 2d. separator was then washed by gentle shaking with 15 Cc of water acidulated with 1 drop of acid, the chloroform stratum was drawn off and wasted, and the watery stratum was added to that in the 1st. separator.

Then 20 Cc of chloroform was added to the contents of the 1st separator, and 6 Gm. of sodium carbonate, added in small portions as long as effervescence was developed by shaking.

Then shook well for 5 minutes, allowed to separate and drew off the chloroform stratum into a tared beaker.

This washing of the alkaline solution was repeated twice when the tared beaker contained about 60 Cc of chloroform solution of crude alkaloids.

The chloroform was evaporated off without boiling and left an amber colored varnish-like extract that weighed 0.38 Gm. = 0.76 p.c. crude alkaloids.

Upon this extract in the beaker 12 Cc of decinormal sulphuric acid was delivered from a burette and the beaker was heated in a hot water-bath with rotary agitation until the soluble part of the extract was dissolved.

Then decinormal solution of potassium hydrate was dropped into the acid solution. The indicator used was narrow (4 mm) strips of blue and neutral litmus paper, touching the tip end to the liquid and cutting off the wet portion at each testing. The dropping in was continued until the liquid produced no change of color on either strip. Then after each additional drop or half drop the testing was made with the neutral strip. This was first touched to water which wetted about 1 Cm. of the end and then was touched to the solution and held in contact for about 10 seconds. Then on close inspection a bluish tinge was perceptible indicating the finished titration.

12 Cc of decinormal acid had been taken and 0.30 Cc. of decinormal alkali had been required to saturate the uncombined acid, leaving 11.70 Cc saturated by the alkaloid of belladonna.

The molecular weight of atropine being 228.38 the calculation for the result was

$$.28838 \times 11.70 = .3374046 \times 2 = .67481 = 0.675 \text{ p.e.}$$

$$\text{Duplicate Assay} \dots\dots\dots 0.685 \text{ p.e.}$$

$$1.360 \div 2 =$$

$$.680 \text{ Average.}$$

For the many assays needed in the design of this paper a shorter assay process was needed and one that could be applied to the differing fractions of pereolate without too much sacrifice in accuracy of results. Such a process the new acetic acid menstruum seems to have supplied by taking the basis or design of the older process and cutting out some steps that could be shown to be dispensable.

THE NEWER ASSAY PROCESS.

Ten grammes of the unpeeled belladonna root, in No. 60 powder, was equably moistened with 5 Cc of 10 p.e. acetic acid—the moistened powder was lightly packed in an extractor,—page 2313—(or some equivalent pereolator,)—was filled to saturation with 10 p.e. acetic acid,—was allowed to digest for 24 hours and was then pereolated to exhaustion, yielding about 200 Cc of pereolate.

This pereolate was evaporated on a hot water-bath to an extract that was hard when cold, and weighed 3.96 Gm.

This extract was dissolved in 20 Cc of a mixture of equal volumes of 91 p.e. alcohol and 10 p.e. water of ammonia,—the solution transferred to a separator,—20 Cc of chloroform added,—the whole well shaken for 5 minutes,—allowed to separate and the chloroform stratum drawn off into a beaker.

During the time required for separating the wetted end of a strip of neutral or acid litmus paper was held in the vapor space of the separator in order to be sure of the full alkalinity of the contents.

Then 4 Cc of 91 p.e. alcohol was added to the contents of the separator and shaken in. Then 20 Cc of fresh chloroform,—5 minutes vigorous shaking, with separation and drawing off the chloroform stratum into the beaker as before.

This addition of alcohol and chloroform,—shaking,—separating and drawing off was repeated for a third and final washing.

The chloroform solution was evaporated from the beaker without boiling leaving a varnish-like extract that weighed 0.15 Gm.

This was dissolved in 6 Cc. of decinormal acid by water-bath heat and agitation and was titrated back with decinormal alkali to the

neutral point using litmus paper indicator in the way described in the old process.

6.00 Cc acid used less 3.65 Cc free acid = 2.35 Cc saturated with alkaloid, $.28838 \times 2.35 = .67769 = 0.680$ p.c.

Duplicate assay 0.680 "

These percentages are true only to the second decimal place, and are therefore so stated. But they are usually trustworthy to 0.005 p.c. It is claimed however that a simple and easy process that will give a result true within this first range of error is more practically useful than a more elaborate process with half that range of error.

This is equivalent to stating the writer's conviction, long held, that for pharmacopœial purposes a process that five pharmacist, out of ten can apply within a variable error of one per cent. of result is of more use than a more elaborate process that not more than one in ten can apply to within half that range of error of result.

The new process has been applied to the percolates as well as to the powder with the same degree of success,—10 Cc of the stronger percolates being evaporated for each assay, and multiples of this volume for the weaker percolates.

Throughout the many applications of the new process it was found that unless the proportion of solid extract was required it was better not to carry the evaporation lower than to a thick liquid of 5 or 6 Gm because it is much easier to wash it clean into the separator with the prescribed volume of the ammonia-alcohol mixture.

The one great difficulty in applying the "shaking out" process in alkaloidal assaying is the formation of emulsions. This difficulty is entirely avoided in this process by the use of alcohol—First to dilute the ammonia, and afterward to replace the alcohol shaken out by the chloroform in each washing of the alkaline liquid. When this was done as prescribed in the process the separation was always prompt and complete, and the chloroform solutions were all fairly clear.

In dissolving the alkaloids out from the crude alkaloids by the decinormal acid, for titration, care, patience, agitation and a hot water-bath are needed, and the heat must be sufficient to fuse the resinous matter that is liable to hold the alkaloid from the acid.

The principal limitation to the accuracy of the new process is in the use of litmus paper as an indicator. By the use of the tip end

of very narrow strips very little of the solution is lifted out and cut off at each testing, but there is a point at which the solution does not change the color of either the blue or the neutral paper where sometimes one and sometimes two drops are required to produce a faint bluish tinge near the middle of the wetted end of the neutral strip, and this difference of one drop sometimes affects the result in the second decimal place of percentage. If the drops be divided, or if centinormal alkali be used when the neutral point is near, a closer result may be reached, but this latter introduces a complication, and only reduces the error by about one-half, or from about 1 in 60 to 1 in 120.

COMPARATIVE PERCOLATIONS.

Five hundred grammes of the same No. 60 powder of the unpeeled belladonna root was taken for each of two parallel percolations the two being carried through under the same conditions of time and management as nearly as practicable.

For one percolation the U. S. P. menstruum, consisting of 800 volumes of 91 p.c. alcohol and 200 volumes of water, was used, and for the other 10 p.c. acetic acid.

Each portion of powder was moistened with 200 Cc of its respective menstruum, both were digested in covered vessels for 24 hours, —packed in syphon percolators, —fully saturated with menstruum, and digested for 20 hours. Then the syphons were started at a slow rate of dropping, and, stopping overnight, were kept nearly parallel to the end.

The percolates were received in 100 Cc fractions in 100 Cc narrownecked, marked flasks and were weighed to one centigramme.

The 100 Cc of the alcoholic U. S. P. menstruum weighed 86.91 Gm and the 100 Cc. of the acid menstruum 101.21 Gm.

These weights subtracted from the differing weights of the fractions give the difference between the weight of the menstruum and the weight of the fractions and thus give a useful indication of the rate and degree of exhaustion. Each successive five fractions were put together and made up to 500 Cc from the next following percolate, —the differences taken, —the percentage of extract and chloroform extract taken, and the percolate assayed for the percentage of alkaloid by the new process, the drops being divided roughly in the titration so as to bring the result into the third decimal place of percentage.

All these results are summed up in the following table :

RATE AND DEGREE OF EXHAUSTION BY DIFFERENCES
AND BY ASSAY.

FRACTIONS OF PERCOLATE.	DIFFERENCES.		EXTRACT.		CHLOROP. EXT.		ALKALOIDS.	
	U. S. P. Men- struum	Acetic Acid Men- struum	U. S. P. Men- struum	Acetic Acid Men- struum	U. S. P. Men- struum	Acetic Acid Men- struum	U. S. P. Men- struum	Acetic Acid Men- struum
	Gm.	Gm.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
1st. 100 Cc.	3.82	13.57						
2d. " "	3.63	12.92						
3d. " "	3.70	10.79						
4th. " "	4.05	8.12						
5th. " "	4.59	5.36						
1st. 500 Cc.	21.48	51.85	12.7	30.1	2.30	1.30	0.634	0.605
6th. 100 "	4.57	3.62						
7th. " "	3.59	1.46						
8th. " "	2.77	.72						
9th. " "	2.39	.51						
10th. " "	1.99	.42						
2d. 500 Cc.	17.45	7.27	6.5	4.2	0.30	0.45	0.036	0.072
11th. 100 "	1.46	.33						
12th. " " ....	.99	.30						
13th. " " ....	.81	.18						
14th. " " ....	.55	.19						
15th. " " ....	.43	.09						
3d. 500 Cc.	5.33	1.13	2.0	0.7	0.10	0.06	0.007	0.006
16th. 100 " ....	.33	.06						
17th. " " ....	.14	.12						
18th. " " ....	.20	.09						
19th. " " ....	.00	.00						
20th. " " ....	.00	.00						
4th. 500 Cc.	3.14	.26	1.1	0.5	0.10	0.06	0.006	0.005
							0.683	0.688

This powdered belladonna root gave on careful assay by the older process, between 0.675 and 0.685 p.c. of alkaloid calculated as atropine and it is accepted as being very near to a mean of 0.680 p.c. Then as the results are practically the same by the newer process the indication is confirmatory of both processes and of their common result,—0.680 p.c.

In reviewing the table a very remarkable difference is shown in both the rate and degree of exhaustion. The acetic acid menstruum extracts more than three times as much in the earlier fractions and exhausts the powder more rapidly and more completely throughout.

The two extracts differ in the same direction both in rate and degree, so that it is surprising to find the alkaloids differing in an opposite direction.

The powder contains 0.689 p.c. of alkaloids.

The first 500 Cc from the U. S. P. menstruum contains 93.23 p.c. of this.

The first 500 Cc from the acid menstruum contains 88.97 p.c. of this.

The second 500 Cc from the U. S. P. menstruum contains 5.29 p.c. of this.

The second 500 Cc from the acid menstruum contains 10.58 p.c. of this.

The third 500 Cc from the U. S. P. menstruum contains 1.03 p.c. of this.

The third 500 Cc from the acid menstruum contains 0.88 p.c. of this.

The fourth 500 Cc from the U. S. P. menstruum contains 0.88 p.c. of this.

The fourth 500 Cc from the acid menstruum contains 0.74 p.c. of this.

Sum of the per centages U. S. P. 100.43, acid 101.17 p.c.

Sum of the alkaloids U. S. P. 0.683, acid 0.688 p.c.

Thus it will be seen that the U. S. P. menstruum gives the largest yield of alkaloid in the early part of the percolate and much the smallest yield of inert and useless extractive matter and is so far the better menstruum, but for washing out the last portion of alkaloid the acid menstruum has a slight advantage.

The management is equally easy in both and when both are finished to fluid extract by the U. S. P. directions the preparations appear to be of equal value. The acid preparation is of much lighter color,—has no deposit in three months' standing and does not precipitate on being added to water.

The alcoholic preparation is of a very dark color,—has a small precipitate within three months that contains traces of alkaloid, and precipitates on being added to water.

The acid menstruum costs less than 2 cents a pint (473 Cc.)

“ alcoholic “ “ more “ 24 “ “



